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Correspondence re: Tri-state conferences (Wisconsin, Illinois, Iowa). 1936-1938

Thwaites, F. T. (Fredrik Turville), 1883-1961

[s.l.]: [s.n.], 1936-1938

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September 24, 1936

Professor A. H. Sutton
University of Illinois
Urbana, Illinois

Dear Professor Sutton:

Could you let us know the date for the Tri-State Conference
as soon as possible so we can arrange our field trips?

Very truly yours,

FTT:N

F. T. Thwaites

March 31, 1936

Prof. A. H. Sutton,
Dept. of Geology,
University of Illinois,
Urbana, Illinois

Dear Professor Sutton:

In reply to yours of the 25th I talked over the matter of the Fourth Tri-State Field Conference with Bean and Twenhofel. Both thought as you do that Calhoun County would be the most interesting. I have not looked up the distance but am sure that would hit us the worst.

Of the other localities we all thought that the second, Rock Island to Warsaw would be preferable.

If you think that Calhoun County is at all practicable we would be willing to consider it.

Your suggestion about an earlier date is a good one but we would like to get that settled earlier than it was last year. That was what forced it so late in the season. Enclosed is a copy of our football schedule. I think you can get advance copies of the others if you ask the proper persons for them.

Very truly yours,

F. T. Thwaites

UNIVERSITY OF ILLINOIS
DEPARTMENT OF GEOLOGY AND GEOGRAPHY
URBANA, ILLINOIS
March 25, 1936.

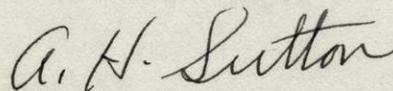
Professor F. T. Thwaites,
Science Hall,
University of Wisconsin,
Madison, Wisconsin.

Dear Professor Thwaites:

As you know, the Fourth Annual Tri-State Field Conference will be held next fall in Illinois. It is my wish to make the preliminary arrangements for the Conference this spring. In order to do so it is necessary to determine the area which best suits the largest number of probable participants, as well as the date. I realize that it is impossible at this time to set a definite date but it may be possible to do so before the end of the present school year. Most of us should be able to decide when we shall be free next fall as soon as the football schedules are announced. I should like to hold the Conference earlier this year than was done last fall. Another letter concerning probable dates will be sent you later.

It seems to me possible to decide the site of the field conference now. I am therefore sending you a list of three localities. Will you see that the members of your organization have an opportunity to express their preference and then will you send me a record of such preference? Of the three localities, the Calhoun County area offers by far the greatest variety of phenomena but has the disadvantage of greater distance. Between the other two there isn't much to choose. The Rock Island to Warsaw trip involves a greater number of stratigraphic units as against the more complete Pennsylvania section of the Peoria to Macomb trip. Glacial features are about equal.

Sincerely yours,



A. H. Sutton, Chairman,
Executive Committee for 1936.

AHS:TJ

PROPOSED AREAS FOR FOURTH ANNUAL TRI-STATE FIELD CONFERENCE

1936

1. Calhoun County--and north along Mississippi River

Features to be examined:

- A. Cap-au-Gres structure
- B. Stratigraphic succession from St. Peter (Ordovician) to McLeansboro (Pennsylvanian)
- C. Pleistocene and Recent physiographic features

✓ 2. Rock Island to Warsaw

- A. Stratigraphic succession from Devonian to Pennsylvanian
- B. Glacial features.
- C. Physiographic features--not as striking as in Calhoun County area.

3. Peoria to Macomb

- A. Stratigraphic section--entirely Pennsylvanian
- B. Glacial features

Please indicate choice

**FOURTH ANNUAL TRI-STATE (ILLINOIS,
IOWA, WISCONSIN) GEOLOGICAL
FIELD CONFERENCE**

GEOLOGISTS and students of geology in the three above-mentioned states participated in the annual tri-state field conference on October 31 and November 1. The conference was held this year in Calhoun and Jersey counties in central western Illinois. It was conducted by A. H. Sutton, University of Illinois, assisted by J. Marvin Weller, Illinois State Geological Survey.

The conference was attended by 117 persons, who traveled in 35 cars. Geologists from eleven universities, colleges and state surveys of the three states and representatives of six oil companies operating in Illinois were present. Invited guests of the conference included six persons from Washington University, St. Louis, Mo., one from Oklahoma A. and M. College and the manager of the Alton, Ill., *Telegraph*. The geology of the stops was described in a mimeographed log and a blue-print map, furnished each participant at the beginning of the conference. In addition each car was supplied with quadrangle topographic maps of the area visited.

The conference began at Hardin, Calhoun County, at 9 A.M. on Saturday. The first day's trip included eight stops in Calhoun County. The stratigraphic section studied during the day is summarized below: *Mississippian*: St. Louis, Spergen (Salem), Warsaw, Keokuk, Burlington, Sedalia (Fern Glen), Chouteau, Hannibal, Louisiana, Saverton. *Devonian*: Cedar Valley. *Silurian*: Joliet, Kankakee, Edgewood. *Ordovician*: Maquoketa, Kimmswick, Decorah, Plattin, Joachim, St. Peter.

Good exposures of all these formations were visited for examination and fossil collecting. Contacts between most adjacent formations were observed. The Cap-au-Gres faulted monocline was studied and discussed. G. E. Ekblaw, Illinois State Geological Survey, explained the origin of the terraces along Illinois River and gave a brief summary of the Pleistocene and recent history of the area. W. H. Twenhofel, University of Wisconsin, and J. E. Lamar, Illinois State Geological Survey, discussed problems of the St. Peter sandstone, comparing the formation in this area with that in the northern portion of the Mississippi Valley.

The annual dinner and general meeting was held at the Stratford Hotel in Alton, Ill., on Saturday night and was attended by 103 persons. No formal papers were presented, but geologic problems of the area were discussed. Dr. Ekblaw presented a more detailed summary of the geologic history than had been given earlier in the day.

On Sunday, November 1, the trip covered portions of Jersey County. Several of the stratigraphic units which had been examined the previous day were seen again, and the Cap-au-Gres structure was studied in more localities. The conference closed at noon on Sunday at an exposure of Pleistocene varved lake deposits which were made in a pond adjacent to the margin of the Illinoian Ice.

The conference will be held next year in Wisconsin under the leadership of Professor F. T. Thwaites, of the University of Wisconsin.

A. H. SUTTON

UNIVERSITY OF ILLINOIS

ILLINOIS

University of Illinois

Allen, W. H.
Beard, C. N.
Borger, Harvey
DeWolf, F. W.
Deuth M. J.
Dietz, Robert
Emery, Kenneth
Fischer, V. N.
Gardner, J. W.
Hagan, W. W.
Hoke, C. J.
Lester, J. L.
Rives, W. B.
Sutton, A. H.
Sutton, Mrs. A. H.
Wanless, H. R.
Williams, J. R.
Wilson, G. M.
Wrath, W. F. ---Total 20

Illinois State Geological Survey

Bell, A. H.
Bradley, W. F.
Cady, G. H.
Carroll, D. L.
Cohee, G. V.
Ekblaw, G. E.
Grim, R. E.
Lamar, J. E.
Machin, J. S.
McCabe, L. C.
Newton, W. A.
Payne, J. N.
Reed, F. H.
Robinson, J. W.
Schopf, J. M.
Townley, Miss Enid
Weller, J. M. ---Total 17

University of Chicago

Anderson? D. A.
Bretz, J. H.
Finwall, Robert
Fisher, D. J.
Foss, Charles
Fuchs, L. H.
Hamilton, Miss Alice

Hitchens, Miss Jean
 MacKnight, F. C.
 Martz, Ed
 Monk, G. D.
 Nelson, V. E.
 Peterson, V. E.
 Sandefur, B. T.
 Tisdell, F. W. -----Total 15

Northwestern University

Ball, J. R.
 Dapples, E. C.
 Howland, A. L.
 Powers, W. E.
 Wellman, D. C. -----Total 5

Augustana College

Byers, Frank
 Horberg, Leland
 Larson, K. G.
 Potter, Frank ----- Total 4

Shurtliff

Shurtliff College

List, E. E. ---Total 1

McKendrie College

McClure, S. M. --Total 1

Total for Illinois ----- 63

IOWA

State University of Iowa

Banks, J. E.
 Bissel, Harold
 Brooks, F. M.
 Brown, Miss Beverly
 Edmund, R. W.
 Foulk, S. H.
 Frye, J. C.
 Furnish, W. M.
 Grissel, Miss Margaret
 Knaack, E. L.
 Miller, A. K.
 Moore, C. A.
 Russell, H. J.
 Scobey, Ellis
 Tappen, W. B.
 Tester, A. C.
 Trowbridge, A. C.
 Vernon, Robert
 Whealdon, E. P.
 Wood, J. E. -----Total 20

Iowa State College

Cline, L. M.
Gwynne, C. S.
Lonsdale, J. T. --Total 3

Simpson College

Williams, Carol --Total 1

Total for Iowas-- 24

WISCONSIN

University of Wisconsin

Hasler, J. W.
Pyre, Augustin
Thwaites, F. T.
Twenhofel, W. H.
Twenhofel, W. Fr.
Tyler, Stanley
Underwood, Miss Nancey
Von Eiff, Herbert ----- Total 8

Total for Wisconsin --- 8

OTHERS, NORMALLY NOT MEMBERS OF THE TRI-STATE CONFERENCE

MISSOURI

Washington University

Ditsworth,
Johnson, H
Kaiser, E. P.
Mayes, H
Wallace, A. J.
Werner, Courtney -----Total 6

Representatives of Petroleum Companies operating in Illinois

Anderson, Carl, Gulf Refining Company
Ballard, J. L., Stanolind Oil and Gas Co.
Kneale, W. C., The Texas Co.
McFarland, L. R., Magnolia Pet. Co.
McCabe, W. S., The Texas Co.
McGehee, J. R., Shell Pet. Co.
McClure, F. S., Shell Pet. Co.
Thomas, G. D., Shell Pet. Co. ----- Total 8

Others

McAdams, John -- Alton Telegraph
Six, R. L., Oklahoma A. and M. College -- Total 2

Grand Total --- 111

REGISTRATION LIST

<u>Name</u>	<u>Address</u>
J. S. Templeton	University Club, Madison
M. E. Kirby	Rosenwald Hall, Chicago
F. W. DeWolf	Urbana, Univ. of Illinois
C. A. Chapman	Urbana, Univ. of Illinois
J. R. Williams	Urbana, Illinois
B. K. Bean	Urbana, Illinois
L. A. Harris	Champaign, Univ. of Illinois
Dr. W. Twenhofel	Lake Forest, Madison
Mrs. W. H. Twenhofel	Lake Forest, Madison
Mrs. Ptriffer	Lake Forest, Madison
H. B. Wood	Northwestern University
W. E. Powers	Northwestern University
Arthur Palmer	Northwestern University
E. C. Dapples	Northwestern University
A. L. Howland	Northwestern University
R. T. Russell	Northwestern University
Bob Garrells	Northwestern University
Joseph Graham	Northwestern University
Harold Funkhouser	Chicago, Illinois
Ernest Paul DuBois	Univ. of Chicago
Carl Fries	Madison
Neil Kivlin	Madison
Tom Chamberlin	Madison
David M. Delo	Knox College, Galesburg, Ill.
F. DrindaK	Univ. of Wisconsin
E. P. Whealdon	Univ. of Wisconsin
Harold R. Wanless	Univ. of Illinois
Mrs. H. R. Wanless	Urbana, Illinois
Donald Franklin	Univ. of Ill., Urbana, Ill.
John L. Dester	Univ. of Ill., Urbana, Ill.
H. B. Wellman	Ill. Geol. Survey
Cove Heilbonner	Ill. Geol. Survey
Don Sutton	Ill. Geol. Survey
V. N. Fischer	Ill. Geol. Survey
John Potsch	Ill. Geol. Survey
Elwood Atherton	Ill. Geol. Survey
M. E. Wing	Beloit College
Edward Sutte	Waukesha
W. L. Ray	Carroll College
L. T. Caldwell	De Kalb, Ill.
Wm. C. Gould	De Kalb, Ill.
H. W. Gould	De Kalb, Ill.
O. J. Gabel	De Kalb, Ill.
C. E. Montgomery	De Kalb, Ill.
Stanley A. Tyler	Univ. of Wisconsin
Ralph Marsden	Univ. of Wisconsin
Howard Kunsman	Univ. of Wisconsin
Paul T. Miller	Superior, Wisconsin

<u>Name</u>	<u>Address</u>
Wilfred Tapper	Iowa City, Iowa
Margaret Grissel	Iowa City, Iowa
Stewart H. Dahl	Iowa City, Iowa
J. E. Wood	Iowa City, Iowa
Louise Gillman	Indianola, Iowa
Alice Hamilton	Chicago, Illinois
Ira Edwards	Milwaukee, Wis.
Elmer R. Nelson	Milwaukee, Wis.
Gerald Johnson	Chicago, Illinois
Eleanor Edson	Madison, Wis.
E. A. Frederickson	Madison, Wis.
R. M. Crump	Madison, Wis.
Ray Wilcox	Madison, Wis.
D. J. Fisher	Univ. of Chicago
J. S. Mackes	Ill. Geol. Survey
M. J. Deuth	Univ. of Ill.
W. H. Allen	Univ. of Ill.
Mrs. A. H. Sutton	Univ. of Ill.
A. H. Sutton	Univ. of Ill.
H. W. Scott	Univ. of Ill.
E. Stewart Fay	Univ. of Chicago
Fred W. Tisdell	Univ. of Chicago
Harold Rigney	Univ. of Chicago
George Olkalaw	Ill. Geol. Survey
Wm. C. Rasmussen	Univ. of Chicago
F. T. Thwaites	Univ. of Wisconsin
L. R. Wilson	Coe College
A. Cross	Coe College
A. Brakaw	Coe College
E. Mickle	Coe College
H. Wall	Coe College
A. F. Sammett	Coe College
W. E. Bartholf	Chicago University
K. G. Larson	Rock Island
L. E. Workman	Urbana, Ill.
Mrs. L. E. Workman	Urbana, Ill.
Mary Neill	Urbana, Ill.
R. C. Emmons	Univ. of Wis.
E. F. Bean	Univ. of Wis.
E. H. Wenberg	Iowa City, Iowa
W. Cameron	Iowa City, Iowa
Howard Rieke	Iowa City, Iowa
Herbert Yoho	Iowa City, Iowa
Warren Scobey	Mt. Vernon, Ia.
N. A. Miner	Carroll College
E. H. Scobey	Iowa City, Iowa
R. C. Baker	Iowa City, Iowa
W. Lowe	Mt. Vernon, Iowa
Paul H. Nelson	Iowa City, Iowa
Beverly Brown	Iowa City, Iowa
Robert L. Bates	Iowa City, Iowa
Earl F. Taylor	Urbana, Ill.

<u>Name</u>	<u>Address</u>
John C. Frye	Iowa City, Iowa
R. C. Spiney	Iowa City, Iowa
Harry J. Russell	Iowa City, Iowa
Dr. A. C. Lester	Iowa City, Iowa
Jeannette Jones	Appleton, Wisconsin
C. S. Gwynne	Ames, Iowa
H. VonEff	Madison, Wisconsin
Reginald Comer	Madison, Wisconsin
Carl Bays	Univ. of Wisconsin
John Lonsdale	Ames, Iowa
F. L. Cuthbert	Ames, Iowa
N. D. Newell	Madison, Wisconsin
W. M. Furnish	Iowa City, Iowa
Carl A. Moore	Iowa City, Iowa
W. M. Fiedler	Madison, Wisconsin
A. Bengtson	Augustana College
Charles Johnson	Augustana College
E. Summerford	Augustana College
E. Yeager	Augustana College
F. Byers	Augustana College
A. Palmer, Jr.	Northwestern
Monta Wing	Beloit College
V. McKelvey	Madison, Wis.
A. K. Miller	Iowa City, Iowa
L. M. Cline	Ames, Iowa
Ruth McKay	Savanna, Ill.
Betty Smith	Chicago, Ill.
R. M. Dudley	Madison, Wisconsin
B. T. Sandofur	Chicago, Ill.
W. Foster	Chicago, Ill.
E. Martz, Jr.	Chicago, Ill.
G. Monk	Chicago, Ill.
J. Hough	Chicago, Ill.
M. Chappars	Chicago, Ill.
D. P. Anderson	Chicago, Ill.
J. H. Boretz	Chicago, Ill.
R. C. Bietz	Chicago, Ill.
F. W. Fryxell	Rock Island, Ill.
J. Norman Payne	Urbana, Ill.
A. C. Mason	St. Louis, Mo.
Clarence Gradin	Superior, Wis.
Jack Pollock	Superior, Wis.
Carol Mason	Milwaukee Downer ✓
Ada Grove Rowland	Milwaukee Downer

Fifth Annual

~~The~~ Tri-State Field Conference of 1937

The Tri-State Field Conference of geologists from Wisconsin, Illinois, and Iowa was held on Oct. 2 and 3, 1937. Objects of study included the Kettle Interlobate Moraine and the Ordovician, Silurian, and Devonian strata of southeastern Wisconsin. The party assembled near Whitewater and visited the famous cut through the Interlobate Moraine a few miles to the southeast. From there the route lay over the pitted outwash terraces southeast of the moraine to Delavan where lunch was eaten at Cushing Memorial State Park. In the afternoon exposures of the uppermost Maquoketa, the Neda iron ore, and the Mayville and Byron divisions of the ~~Niagara~~ ^{Silurian} near Mayville were visited. A stop was also made at the quarries where the well-known Lannon stone is obtained. The stratigraphic relation of this rock to the Byron at Mayville was discussed. Despite the lithologic resemblance of these strata to the Byron, it was urged by F. T. Thwaites that well records show that the Lannon stone lies so high in the sequence that it must be inter-reef Racine. The Byron is believed to lie farther west and to be concealed because its outcrop is narrow.

The night was spent at Waukesha with the usual banquet followed by extemporaneous talks by E. F. Bean, Ira Edwards, W. H. Twenhofel, and F. T. Thwaites.

On Sunday morning the Waukesha quarry in Byron (?) and Waukesha beds was visited. It was brought out in discussion that inasmuch as the true position of the Waukesha is not known at its type locality largely by reason of faulting, the name should be abandoned. The Devonian-Silurian contact was examined near Thiensville and the Devonian in Estabrook Park, Milwaukee. The party broke up at a quarry in Wauwatosa where a Racine reef is well exposed. A few also visited a nearby quarry in inter-reef Racine beds.

Attendance totalled 154 from 19 schools and the Geological Surveys of Illinois, Wisconsin, and Iowa. F. T. Thwaites was chairman of the committee in charge. Innovations consisted of first, a modest speed which allowed the conference to be completed on schedule without accident ~~and~~ second, employment of students with red flags who directed cars through stop signs where traffic was moderate and supervised parking at stops, *and third, red flags on cars* In addition the party was under regular police escort where traffic was heavy. These arrangements were under the direction of C. A. Bays. *for identification*

The conference will be held in Iowa in 1938.

The Tri-State Field Conference of 1937

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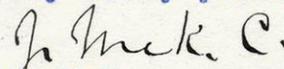
SCIENCE
EDITORIAL DEPARTMENT

Grand Central Terminal
New York, N. Y.
February 26, 1937

Dear Professor Sutton:

I regret to write that the enclosed report has reached us too late to make it desirable to use it in SCIENCE.

Very truly yours,



J. McKeen Cattell

Professor A. H. Sutton
University of Illinois
Urbana, Illinois

Enclosure

UNIVERSITY OF ILLINOIS
DEPARTMENT OF GEOLOGY AND GEOGRAPHY
URBANA, ILLINOIS

Feb. 23, 1938

Prof. F. T. Thwaites
Dept. of Geology
Univ. of Wisconsin
Madison, Wisconsin

Dear. Prof. Thwaites:

I have already written to Prof. Trowbridge signifying my agreement with the proposal for plans for the Tri-State Field Conference next year.

I just received the enclosed communication from Science. I am sorry that this was too late for publication. I sent it on immediately upon receiving it.

Cordially yours,

A. H. Sutton
A. H. Sutton

March 2, 1938

Prof. A. H. Sutton,
Dept. of Geology and Geography,
University of Illinois,
Urbana, Illinois

Dear Prof. Sutton:

I wish to thank you for yours of the 23rd with enclosures.

With regard to the write up of the trip I had entirely forgotten that such was customary. It is too bad that I delayed so long when I was reminded of it but when all is said and done who really cares to read such a notice besides those who were there? I am sure I dont know! And those who were on the trip do not need it, so far as I can see.

With best regards,

Sincerely,

Avalon Hotel Oct. 2, 1937

Rooms without bath (Two names both in same room)

- ~~W. S. Twenhofel~~
- ~~J. S. Templeton - Herb. Von Eiff~~
- A. C. Mason
- H. S. Kunsman
- Vincent McKelney - E. A. Frederickson (twin beds)
- Ray Wilcox - Ralph Marsden
- R. C. Emmons
- S. A. Tyler
- W. M. Fiedler - ~~Jack Morris~~
- E. F. Bean
- Scobey - ~~Runner~~ ✓
- R. I. Bates - Spivey ✓ OK
- Folk
- Tippin
- P. S. Miller
- Cline - L. Guthbert ✓
- A. K. Miller - W. M. Furnish ✓
- W. R. Foster
- C. A. Chapman
- J. L. Hough
- Gahels
- E. P. DuBois
- Powers - Ward
- Howland - Dappler
- Russell - Palmer
- Gady - Graham

miner

Dundak

Chapman

Total Banquet

72

17

89

Avalon Hotel Oct. 2, 1937

Rooms with bath (Two names both in same room)

- ~~W. H. Twenhofel - Mrs. Twenhofel~~
- Lillian Pfeiffer
- C. A. Bays ✓
- N. D. Newell ✓
- F. T. Thwaites ✓
- E. A. Edson - Ruth May Dudley + ~~Christina~~
- Margaret Grissel - Beverly Brown ?
- J. T. Lonsdale ✓
- Louise Fillman ✓ ~~Christina~~
- Corwyn D. Dorsey - Gwen R. Bower ✓
- C. S. Gwynne ✓
- A. H. Sutton - Mrs. Sutton ✓
- F. W. DeWolf ✓
- Alice Hamilton ✓
- Jeanette Jones ✓
- L. R. Thiesmeyer ✓
- (Beryl K. Bean ??)

Ruth McKay - Betty Smith ?

*Betty S. Illman Sunny 2 single ✓
5 double ✓*

Tester ✓

T-2

UNIVERSITY OF MICHIGAN

MUSEUM OF PALEONTOLOGY
ANN ARBOR

E. C. CASE, DIRECTOR AND CURATOR
OF VERTEBRATES
G. M. EHLERS, CURATOR OF
PALEOZOIC INVERTEBRATES
L. B. KELLUM, CURATOR OF MESOZOIC
AND CENOZOIC INVERTEBRATES

C. A. ARNOLD, CURATOR OF
FOSSIL PLANTS
W. H. BUETTNER, PREPARATOR
HELEN ASKREN, CATALOGER AND
LIBRARIAN

September 30, 1937

Dr. F. T. Thwaites,
Science Hall,
Madison, Wisconsin.

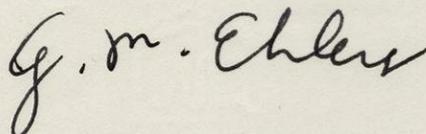
Dear Dr. Thwaites:

I received your kind invitation to attend the Tri-States Field Conference on October 2nd and 3rd several days ago.

I have been trying to find a way to attend and on three occasions was on the point of notifying you that I planned to come with two other persons. Work has now piled up so high that I dare not take off four days at this time for the trip. I regret very much that I cannot go over the Silurian and Devonian sections with you; for many years I have been hoping to have another and better look at these sections than I had years ago.

I should be pleased to receive further notices of your field conferences and to be given an opportunity to attend.

Sincerely yours,



G. M. Ehlers,
Acting Director, Museum of Paleontology

MILWAUKEE PUBLIC MUSEUM
MILWAUKEE, WISCONSIN
S. A. BARRETT, DIRECTOR

DEPARTMENT OF GEOLOGY
IRA EDWARDS, CURATOR

September 16, 1937.

Mr. F. T. Thwaites,
Wisconsin Geological Survey,
University of Wisconsin,
Madison, Wisconsin.

Dear Fred:

Your letter of September 11 arrived, and I am returning to you my reservation for the field trip. I do not think I will stay in Waukesha Saturday night, but will return home and meet the party at the quarry the following morning.

Since writing to Professor Twenhofel, I have received permission to go into the County Quarry and the Electric Company Quarry at Thiensville. In the latter case, they would like to know the approximate hour we expect to reach their place as they would like to have a man on duty at the time. Will you kindly let me know so that I can notify them?

In regard to the police escort, this will have to be handled through the sheriff's office, as most of the trip will be outside of the ^{city} ~~county~~. Dr. Barrett is quite certain that he will be able to obtain an escort for us without difficulty, but we will have to know the exact itinerary over which we expect to travel. I would suggest

Mr. F. T. Thwaites

September 16, 1937

that we enter the county on Highway 18, turning north on 100 to the county quarry, then east on 16 to County Trunk P, follow this north ^{beyond} to the county line and then eastward to Thiensville. Returning, we would again enter the county on 57, going east on 100, ^{to} County Trunk B, following that to the north entrance of Estabrook Park, we would go west on Highway 16, to 76th Street, and then to Francey's Quarry. I think this follows the route which you outlined in your letter as nearly as I can interpret it. If you have any changes to make, let me know as soon as possible, as we will have to give the sheriff the exact itinerary, with some estimate of the time involved.

I will be glad to do whatever you want in the line of speaking at the various stops. Those which you suggest being okey with me. With best regards, I remain

Very truly yours,

Ira Edwards

ENC:
IE:MF

Ira Edwards

ARTHUR C. TROWBRIDGE
DIRECTOR AND STATE GEOLOGIST
ALLEN C. TESTER
ASSISTANT STATE GEOLOGIST

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
103 GEOLOGY BUILDING
IOWA CITY

GEOLOGICAL BOARD
NELSON G. KRASCHEL
GOVERNOR OF IOWA
EUGENE A. GILMORE
PRESIDENT STATE UNIVERSITY OF IOWA
CHARLES E. FRILEY
PRESIDENT IOWA STATE COLLEGE
ARTHUR C. TROWBRIDGE
PRESIDENT IOWA ACADEMY OF SCIENCE
CHARLES W. STORMS
AUDITOR OF STATE

June 10, 1937

Prof. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

Dear Mr. Thwaites:

Your letter of June 8 is at hand. The matter of the Iowa representative on the Committee for the Tri-State Conference is of little consequence. Reviewing the files, however, I find that the election at Dubuque November 16, 1935, designated Professor Sutton of Illinois, yourself of Wisconsin, and myself from Iowa for the three year period beginning at that time. In other words, the idea was to elect a committee to function for three years which would give a complete round of the states involved, so that following the Iowa Conference in 1938 there will be a new election of three members to carry on for the succeeding round of field trips.

The matter of setting a date for the Conference is, of course, a delicate one, as it is difficult to meet the requirements of each institution. However, our experience during the past two years has shown definitely that the meeting should be very early or very late. A late field date has many objections from the standpoint of field work and convenience in transportation. The early date is about the only alternative. I recall that we discussed the matter at Iowa following the 1935 Field Conference, which was after the middle of November, and decided that the next time we would make every attempt to have the meeting early in October.

The October 23rd date is the Michigan game at Iowa City, and it has been officially designated as Dads' Day, which has come to be quite an event

F.T.T.

2

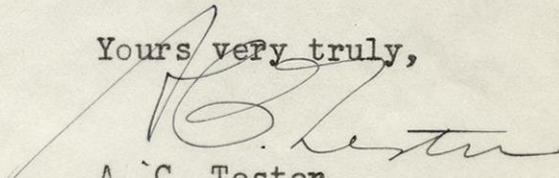
6/10/37

at this institution. November 6th is Homecoming Day, and, of course, I suppose that October 30th is a Homecoming date or important game elsewhere. Eliminating a middle to late November field conference as undesirable, Iowa proposes October 2nd, 9th, or 16th. Your Homecoming is the 16th, so that eliminates that date; and I presume the 9th is also undesirable from the standpoint of other schools, although it is still early in the football season.

Frankly, I feel that it would be highly desirable to have the Conference on either the 2nd or 9th of October, as this is early enough to insure good weather and yet late enough to follow the rush at the opening of school. You mention the problem of heavy traffic in the Milwaukee area. Do you believe that this would be of sufficient difference on any week-end during the month of October? Certainly, I would not want to urge a time when hazards to our group would be increased.

I feel that you are wise in making plans for next fall at this time. The earlier that this date can be set and announcements distributed, the better will be the attendance.

Yours very truly,



A. C. Tester

ACT:A

UNIVERSITY OF ILLINOIS
DEPARTMENT OF GEOLOGY AND GEOGRAPHY
URBANA, ILLINOIS

April 13, 1937

Prof. F. T. Thwaites
Dept. of Geology
Univ. of Wisconsin
Madison, Wisconsin

Dear Prof. Thwaites:

Dr. Leighton has recently asked me about plans for the Tri-State Field Conference for next fall. He is anxious that the scheduling of the trip for next fall be completed this spring. I too, believe that it is a good idea to make arrangements this spring. That is the procedure which was followed for the last conference. I canvassed heads of departments and geological surveys for the most suitable dates. With that done it is easier to schedule other events. Leighton informs me that Oct. 8 and 9 have been set aside for their Mineral Industries Conference next fall.

Trusting that it will be possible to make many of the arrangements this spring, I am

Sincerely yours,

A. H. Sutton

May 27, 1937

Major John L. Griffiths
Commissioner of Athletics
Sherman Hotel
Chicago, Illinois

Dear Sir:

In arranging the date for a conference of geologists from this university as well as Iowa, Illinois, Northwestern, and Chicago, it would be most helpful to have the football schedule for all of the universities concerned so that we could arrange a date that would be most nearly satisfactory for everyone. Our Athletic office informs me that you can give me this information, which will be very greatly appreciated.

Very truly yours,

FTT:N

F. T. Thwaites

September 24, 1937

Chief of Police
Waukesha
Wisconsin

Dear Sir:

On Saturday, October 2d, we are bringing the Tri-State Field Conference of geologists to Waukesha for the night. The party is traveling by car and there will probably be at least thirty cars. Headquarters will be at the Avalon hotel. It would very greatly facilitate matters if we have a man meet us at the intersection of North Street and Broadway - that is the junction of 164 with 30 - about 5:30 P.M. It would also help to have a man on the ground when we are arriving at the hotel so as to direct getting the cars off the street as soon as possible.

As I understand it there is a public parking ground about three blocks from the hotel where cars can be left all night. I was planning that the line-up in the morning at 8 o'clock will be near to or in this parking ground if that is agreeable. The morning route takes us out on county trunk F back to the North Street, thus turning out of the city again. It would very greatly help matters to have a man help us at this point.

Anything you can do to help us will be very greatly appreciated.

Very truly yours,

FTT:N

F. T. Thwaites

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	FULL RATE
DAY LETTER <input checked="" type="checkbox"/>	DEFERRED
NIGHT MESSAGE	NIGHT LETTER
NIGHT LETTER	SHIP RADIOGRAM

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

R. B. WHITE
PRESIDENT

NEWCOMB CARLTON
CHAIRMAN OF THE BOARD

J. C. WILLEVER
FIRST VICE-PRESIDENT

CHECK
ACCT'G INFMN.
TIME FILED

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Urbana, Illinois
September 30, 1937

F. T. Thwaites
Science Hall
Madison, Wisconsin

ILLINOIS SURVEY SENDING FOLLOWING PERSONS IN SURVEY CARS MESSRS. LEIGHTON, EKBLAW, MACHIN, WORKMAN, WILLMAN, HEILBRONNER, SUTTON, PAYNE, TAYLOR, FISCHER, AHERTON, POTSCH, AND MISS NEILL STOP PLEASE MAKE THIRTEEN BANQUET RESERVATIONS AND RESERVE TWO SINGLE AND FIVE DOUBLE ROOMS WITH BATH AT AVALON HOTEL IF FEASIBLE.

(SIGNED)

M. M. Leighton

Confirmation ✓
Files

ALL MESSAGES TAKEN BY THIS COMPANY ARE SUBJECT TO THE FOLLOWING TERMS:

To guard against mistakes or delays, the sender of a message should order it repeated, that is, telegraphed back to the originating office for comparison. For this, one-half the unrepeated message rate is charged in addition. Unless otherwise indicated on its face, this is an unrepeated message and paid for as such, in consideration whereof it is agreed between the sender of the message and this company as follows:

1. The company shall not be liable for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the unrepeated-message rate beyond the sum of five hundred dollars; nor for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the repeated-message rate beyond the sum of five thousand dollars, unless specially valued; nor in any case for delays arising from unavoidable interruption in the working of its lines; nor for errors in cipher or obscure messages.

2. In any event the company shall not be liable for damages for mistakes or delays in the transmission or delivery, or for the non-delivery, of any message, whether caused by the negligence of its servants or otherwise, beyond the sum of five thousand dollars, at which amount each message is deemed to be valued, unless a greater value is stated in writing by the sender thereof at the time the message is tendered for transmission, and unless the repeated-message rate is paid or agreed to be paid, and an additional charge equal to one-tenth of one percent of the amount by which such valuation shall exceed five thousand dollars.

3. The company is hereby made the agent of the sender, without liability, to forward this message over the lines of any other company when necessary to reach its destination.

4. Domestic messages and incoming cable messages will be delivered free within one-half mile of the company's office in towns of 5,000 population or less, and within one mile of such office in other cities or towns. Beyond these limits the company does not undertake to make delivery, but will, without liability, at the sender's request, as his agent and at his expense, endeavor to contract for him for such delivery at a reasonable price.

5. No responsibility attaches to this company concerning messages until the same are accepted at one of its transmitting offices; and if a message is sent to such office by one of the company's messengers, he acts for that purpose as the agent of the sender.

6. The company will not be liable for damages or statutory penalties in any case where the claim is not presented in writing within sixty days after the message is filed with the company for transmission.

7. It is agreed that in any action by the company to recover the tolls for any message or messages the prompt and correct transmission and delivery thereof shall be presumed, subject to rebuttal by competent evidence.

8. Special terms governing the transmission of messages according to their classes, as enumerated below, shall apply to messages in each of such respective classes in addition to all the foregoing terms.

9. No employee of the company is authorized to vary the foregoing.

THE WESTERN UNION TELEGRAPH COMPANY

INCORPORATED

R. B. WHITE, PRESIDENT

CLASSES OF SERVICE

TELEGRAMS

A full-rate expedited service.

NIGHT MESSAGES

Accepted up to 2:00 A.M. at reduced rates to be sent during the night and delivered not earlier than the morning of the ensuing business day.

Night Messages may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such night messages at destination, postage prepaid.

DAY LETTERS

A deferred day service at rates lower than the standard telegram rates as follows: One and one-half times the standard night letter rate for the transmission of 50 words or less and one-fifth of the initial rates for each additional 10 words or less.

SPECIAL TERMS APPLYING TO DAY LETTERS:

In further consideration of the reduced rate for this special Day Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

A. Day Letters may be forwarded by the Telegraph Company as a deferred service and the transmission and delivery of such Day Letters is, in all respects, subordinate to the priority of transmission and delivery of regular telegrams.

B. This Day Letter is received subject to the express understanding and agreement that the Company does not undertake that a Day Letter shall be delivered on the day of its date absolutely, and at all events; but that the Company's obligation in this respect is subject to the condition that there shall remain sufficient time for the transmission and delivery of such Day Letter on the day of its date during regular office hours, subject to the priority of the transmission of regular telegrams under the conditions named above.

NIGHT LETTERS

Accepted up to 2:00 A.M. for delivery on the morning of the ensuing business day, at rates still lower than standard night message rates, as follows: The standard telegram rate for 10 words shall be charged for the transmission of 50 words or less, and one-fifth of such standard telegram rate for 10 words shall be charged for each additional 10 words or less.

SPECIAL TERMS APPLYING TO NIGHT LETTERS:

In further consideration of the reduced rates for this special Night Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

Night Letters may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such Night Letters at destination, postage prepaid.

FULL RATE CABLES

An expedited service throughout. Code language permitted.

DEFERRED HALF-RATE CABLES

Half-rate messages are subject to being deferred in favor of full rate messages for not exceeding 24 hours. Must be written in plain language.

CABLE NIGHT LETTERS

An overnight service for plain language communications, at one-third the full rate, or less. Minimum of 25 words charged for. Subject to delivery at the convenience of the Company within 24 hours.

SHIP RADIOGRAMS

A service to and from ships at sea, in all parts of the world. Plain language or code language may be used.

THE REGENTS OF THE UNIVERSITY OF WISCONSIN
MADISON, WISCONSIN
ACCOUNTING DEPARTMENT

6344

Voucher No. _____

Enclosed please find draft covering payment in full of invoices listed below. In case of discrepancies communicate with this office, referring to the voucher number shown above. Address all monthly statements to "Univ. of Wis., Purchasing Dept."

To F T Thwaites
Science Hall
Madison, Wis.

Univ. of Wis.

U. OF W. ACCOUNT NOS.				DATE OF INVOICE	AMOUNT OF INVOICE	DEDUCT'N FOR FRT. DISC., ETC.	NET AMOUNT
PURCHASE ORDER	YEAR INCUR	TYPE	REQUISITION				
	38	28		9-20-37			21.30
			TOTAL		u		

The
SIXTH ANNUAL TRI-STATE FIELD CONFERENCE

Preliminary Announcement

The Sixth Annual Tri-State Field Conference will be held in Madison, Dallas, Guthrie, and Polk counties, Iowa, on Saturday, October 29 and Sunday, October 30, 1978. Several Missouri and Kansas geologists, Dr. Raymond C. Moore and others, have expressed an interest in the area to be studied, and we are expecting a good representation from these nearby states.

The party will assemble at 9:15 A.M., Saturday, October 29, at the junction of Iowa Highways 2 and 251, a short distance west of the small town of Bevington; this is about 20 miles southwest of Des Moines. If you are detained or wish to join the party later, you may do so at the lunch stop in Pammel State Park between twelve and twelve forty-five o'clock.

The Conference will hold its annual informal dinner at Younker's Tea Room, Saturday evening at 6:30 P.M. The price of the dinner is eighty-five cents. The entrance to Younker's Tea Room is on the east side of Eighth Street between Walnut and Locust. Following the dinner there will be a short business meeting, and after that there will be an informal and not pre-arranged discussion of the geology that we will have seen during the day. Dr. A. C. Trowbridge, State Geologist of Iowa, has agreed to preside at this meeting. Questions will be entertained.

It has been the custom in preliminary announcements to list several hotels with their rates. We are including such a list, but the Committee will not make hotel reservations. Select the type of room that you wish, and make your own reservation Saturday night. Conference Headquarters will be at the Kirkwood Hotel.

<u>Hotel</u>	<u>Double</u>		<u>Rates</u>	
	With Bath	Without	With Bath	Without
Chamberlain	3.00		2.00	
	3.50	2.50	2.50	1.50
Randolph	4.00	3.00	2.50	1.75
Elliott	2.50	2.00	1.50	1.25

All rooms in the following hotels are with bath.

	<u>Twin Beds</u>		
Kirkwood	3.50	4.50	2.50
	4.00	5.00	3.00
Savery	3.50		2.50
Fort Des Moines	4.00		3.00
	to		to
	7.00		5.00

Itinerary. - The Conference will be devoted largely to the study of Pennsylvanian rocks with the Des Moines and lower Missouri beds receiving special attention. The lower Pennsylvanian series was named the Des Moines from outcrops about the city of that name. Yet the rocks of this type area have heretofore been known only in a very general way. The series has been examined anew and in great detail. Individual units, for example coal smuts a fraction of an inch in thickness, have been traced from Guthrie County, Iowa, southeastward to the Missouri line. Through recent work in southern Iowa and northern Missouri the Iowa Survey can definitely correlate, for the first time, many of the Pleasanton, Henrietta, and Cherokee units with their equivalents in Missouri and even in Kansas.

Although the trip is to be devoted largely to the examination of Pennsylvanian rocks and to their sedimentary cycles, there will be in addition other stops for those not especially interested in Pennsylvanian stratigraphy and sedimentary cycles. For example, the Redfield anticline will be visited, at one locality two well-developed channel sandstones of quite different ages will be seen cutting deeply into underlying strata, a few cuts showing Kansan and Wisconsin tills and Peorian loess will be seen, and Pleistocene drainage changes in the Des Moines River and its tributaries will be noted.

The group will be dismissed Sunday at noon at a point near Camp Dodge just above Des Moines.

Please note. - The trip has been logged so that we will not have to drive over 40 miles per hour. The stops are not far apart and ample time has been allowed for each stop. We should be in Des Moines Saturday afternoon at 5:00 P.M. or thereabouts.

Bring your lunch the first day. - The lunch stop will be in Pammel State Park where there will be tables, open fireplaces, rest rooms, a limited amount of shelter in case of rain (which reminds us that the entire route is on all-weather roads), and drinking water. The Committee will make a special effort this year to see that the park pump has a handle.

Literature. - Most of the literature pertaining to this area is out-of-date, but a short paper by Condra and Upp accurately describes the sections that we will see at some of the stops west of Winterset.

1. Bain, H. F., The geology of Polk County, Iowa; Iowa Geol. Survey, vol. 7, 1896, pp. 263-412.
2. Bain, H. F., The geology of Guthrie County; Iowa Geol. Survey, vol. 7, 1896, pp. 413-488.
3. Tilton, J. L., and Bain, H. F., The geology of Madison County; Iowa Geol. Survey, vol. 7, 1896, pp. 489-539.
4. Leonard, A. G., The geology of Dallas County; Iowa Geol. Survey, vol. 8, 1898, pp. 51-118.

5. Tilton, J. L., The Missouri series of the Pennsylvanian system in southwestern Iowa; Iowa Geol. Survey, vol. 29, Ann. Repts. for 1919 and 1920, pp. 223-313.
6. Condra, G. E., and Upp, J. E., The Middle River traverse of Iowa; Nebraska Geol. Survey, paper no. 6., 1934.

So that proper arrangements may be made for the conference, will you please fill out the enclosed slip, indicating whether or not you plan to attend the conference and whether you will attend the banquet. Return to L. M. Cline, Geology Department, Iowa State College, Ames, Iowa, at your earliest convenience. It is recommended that all cars be covered by liability and property damage insurance.

The Executive Committee for 1938

L. M. Cline, Chairman
F. T. Thwaites
A. H. Sutton

Name _____

Address _____

I expect to attend the conference. _____

I do not expect to attend the conference. _____

I expect to attend the banquet. _____

I do not expect to attend the banquet. _____

It is expected that you will make your own arrangements for transportation. If this is not convenient, however, the Committee will try to arrange for your transportation if you will let us know a few days before the conference convenes.

ELEVENTH TRI*STATE FIELD CONFERENCE
Eastern Wisconsin
October 11 and 12, 1947

This is the first and final announcement of the Tri-State Geological Field Conference scheduled to meet in eastern Wisconsin on Saturday and Sunday, October 11 and 12.

Conference route and objectives.-- The main geological objective is the study of the Silurian rocks and Pleistocene deposits of eastern Wisconsin. Starting at Iron Ridge where the Maquoketa Ordovician shale is exposed, the route is northward toward Fond du Lac and northeastward toward Manitowoc along the Silurian outcrop belt. In addition to a study of Silurian stratigraphy and sedimentation the trip affords numerous opportunities to study the Pleistocene of this area.

Conference leaders.--Professor Twenhofel will lead the discussion on the Silurian and Professor Thwaites will discuss the Pleistocene.

Assembly point.--Iron Ridge, Wisconsin (about 50 miles northeast of Madison) at 8:30 A.M. central standard time, Saturday, October 11. Automobiles line up on Main Street just north of intersection with Wisconsin Highway 67. If you are late you may contact the group at the quarry stop near the junction of Wisconsin Highways 67 and 33.

Hotel and meal stops.--Lunch stop Saturday at Lakeside Park in Fond du Lac; bring your lunch. Headquarters Saturday night will be the Hotel Manitowoc in Manitowoc. Their advertised rates are from \$2.00 to \$3.50 for singles. Make your own reservation with R. C. Arsineau, Assistant Manager, Hotel Manitowoc, Manitowoc, Wisconsin, mentioning that you are a part of the Tri-State group. No arrangements are being made for Sunday lunch, but the last stop is at High Cliff Park where there are picnic facilities.

Banquet.--The hotel will not be able to provide banquet space, so other arrangements are being made. Negotiations are not complete but it is expected that the price of the meal will be \$1.75 more or less. Because we have to guarantee a certain number of places it is absolutely necessary that reservations be made by Monday, October 6th.

Final stop.--The last scheduled stop of the conference will be at High Cliff Park, near Sherwood, on the northeast side of Lake Winnebago.

Reservation for Banquet

Please reserve _____ plate(s) for me for the conference dinner in Manitowoc to be given on the evening of October 11th.

Signed _____

Address _____

Mail this reservation to L. M. Cline, Geology Department, University of Wisconsin, Madison 6, Wisconsin. Mail before October 6th.

Oct. 13, 1937

Dr. Ira Edwards,
Milwaukee Public Museum,
Milwaukee, Wisconsin

Dear Ira:

I have been so busy since the Tri-State that I have just got around to thanking you for all that you did for it. We all greatly appreciated your cooperation.

We are leaving it to you to thank the Milwaukee County police for their aid as you arranged for them.

So far as we know there were no really serious complaints in regard to the trip even if some did find the speed rather less than they are used to? I think the trip will go down in history as one which kept to the time table.

With best regards and thanks,

Sincerely,

IOWA STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS

AMES, IOWA

October 7, 1937

DEPARTMENT OF GEOLOGY

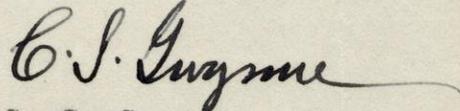
Mr. F. T. Thwaites
Science Hall
Madison, Wisconsin

Dear Mr. Thwaites:

I was sorry I did not have a chance to see you again before the break-up of the Tri State Conference last Sunday. I wanted to tell you that I thought the Conference a splendid success. Please accept my thanks and congratulations, and convey the same to Messrs. Edwards, Twenhofel, Bean and the numerous others who contributed to the success of the affair.

With kindest regards,

Sincerely yours,



C. S. Gwynne
Assoc. Prof. of Geology

CSG:dd

September 29, 1937

Avalon Hotel
Waukesha, Wisconsin

Gentlemen:

Enclosed please find preliminary list of reservations for the Tri-State Field Conference, October 2d. This is the best I could do from the blanks which have been turned in, not all of which are quite clear as to what they want. The total reservations for the banquet are larger and are approximately 69^{7/2}. The final confirmation of this will be given by telephone from Delafield Saturday afternoon, and we can also state more definitely about rooms at that time.

I have written the Chief of Police about parking all night at the city parking ground but have received no reply. I also requested him to have a man meet us at the Junction of 164 and Broadway when we get into town from the north, and also see us out of town - or at least into North Street - from the line-up near the parking ground at 8 A.M. Sunday. Could you please see that this is going to be carried out?

Very truly yours,

FTT:N

F. T. Thwaites

September 30, 1937

Avalon Hotel

Waukesha, Wisconsin

Gentlemen:

Requests today were received for two rooms without bath and for three single and five double rooms with bath. *Teeter & Telmeri Sunny*

The net increase in registrations for the banquet is 17, after deducting some cancellations. One man has cancelled his room reservation - Mr. Morris. There doubtless will be a lot of others who will show up who will want rooms but it is not clear from their blanks just what they want, so I omitted them. *Harry*

Very truly yours,

FTT:N

F. T. Thwaites

A New Modern
Fire Proof Hotel
Owned and Operated
by Waukesha Citizens
for Waukesha's Guests.

Avalon Hotel

WAUKESHA, WIS.



October 3, 1937

Mr. F. T. Thwaites,
R-4
Madison, Wis.

Dear Mr. Thwaites:

We wish to thank you
for the business which you brought us, and
hope that everything was satisfactory.

Very truly yours,

HOTEL AVALON

Wm. J. Frank - Mgr.

WJF*MHS

DEPARTMENT OF
REGISTRATION AND EDUCATION
JOHN J. HALLIHAN, DIRECTOR
SPRINGFIELD

BOARD OF NATURAL RESOURCES
AND CONSERVATION
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PRESIDENT ARTHUR CUTTS WILLARD

STATE OF ILLINOIS
HENRY HORNER, GOVERNOR
STATE GEOLOGICAL SURVEY DIVISION

M. M. LEIGHTON, CHIEF
305 CERAMICS BUILDING
UNIVERSITY OF ILLINOIS CAMPUS

URBANA

September 27, 1937

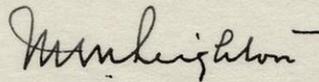
Dr. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

My dear Thwaites:

Dr. David M. Delo has recently been appointed Head of the Department of Geology at Knox College, Galesburg, Illinois. I suggest that you send him an invitation to attend the Tri-States trip by early mail, together with itinerary.

Looking forward to seeing you the latter part of this week, I am

Cordially yours,


Chief.

C
O
P
Y

WAUKESHA COUNTY HIGHWAY COMMISSION

Waukesha, Wisconsin
September

E. F. Bean
Madison, Wis.

Dear Sir:

I have made arrangements for a Deputy to meet your delegation at 83-18 State Highways at 10:30 A.M. on October 2, 1937.

Hoping this arrangement meets your approval, I am

Yours truly

(Signed) H. B. Burton

MILWAUKEE PUBLIC MUSEUM
MILWAUKEE, WISCONSIN
S. A. BARRETT, DIRECTOR

DEPARTMENT OF GEOLOGY
IRA EDWARDS, CURATOR

September 27, 1937

Mr. F. T. Thwaites,
Dept. of Geology,
University of Wisconsin,
Madison, Wisconsin.

Dear Fred:

Dr. Barrett called Sheriff Mitten,
and made arrangements for two men to accompany
our party on Sunday. Dr. Barrett sent him several
copies of our intended route and they will be
waiting for us at the county line. I think this
will be satisfactory to all of you. Hoping to
see you Saturday morning, I remain

Very truly yours,

Ira Edwards

Ira Edwards

IE:MF

September 24, 1937

Mr. W. C. Fischer
State Teachers College
Whitewater, Wisconsin

Dear Mr. Finch:

I have delayed replying to yours of the 15th because I thought I would have the complete log of the trip ready. However, it is not yet finished so I can simply tell you that we will eat lunch in Cushing Memorial State Park at Delafield. We are due to arrive there at 11:30. I will be glad if you can join us then.

Yours very truly,

FTT:W

F. T. Thwaites

Superior, Wis.

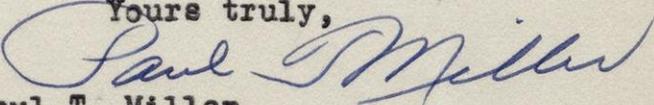
Sept. 18, 1937

Prof. F·T·Thwaites
Science Hall
Madison, Wis.

Dear Professor Thwaites:

I am returning your question ^{on} the Tri-State Conference. I plan to drive to Madison Friday night. If there are any who wish to go with me from Madison Saturday morning, I will be glad to take them. I plan to take one boy who will be at Madison this year and may bring one student from here. That will leave room for at least two.

Yours truly,


Paul T. Miller

LK/PM
ENC

MILWAUKEE PUBLIC MUSEUM
MILWAUKEE, WISCONSIN
S. A. BARRETT, DIRECTOR

DEPARTMENT OF GEOLOGY
IRA EDWARDS, CURATOR

September 22, 1937.

Mr. Fred T. Thwaites,
University of Wisconsin,
Madison, Wisconsin.

Dear Fred:

The road log which Mr. Bays sent on has been received. I made a condensation of the part referring to Milwaukee County, which we can send to the Sheriff, and I think we will have no difficulty in making arrangements. I have noted the various places ^{at} which you want me to speak, and will be pleased to take care of them for you.

Very truly yours,

Ira Edwards

IE:MF

Ira Edwards

C. M. YODER.
PRESIDENT

STATE TEACHERS COLLEGE
WHITEWATER, WISCONSIN

September 15, 1937

Mr. Frederick Thwait's
Science Hall
Madison, Wisconsin

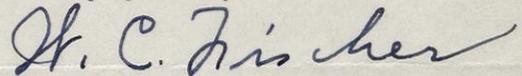
My dear Mr. Thwait's:

I am replying in response to your announcement of recent date.

I am unable to attend the meeting because of a previous engagement. I shall try to complete my business before dinner and if possible I will try to join you in the afternoon.

Could you let me know just where you people might be for luncheon?

Very truly yours,



W. C. Fischer

From the
Thwaites Estate
July, 1980

Detailed Log for
Leaders and Flagmen

TW
THWAITES

TRI-STATES FIELD CONFERENCE
October 2 and 3, 1937
SOUTHEASTERN WISCONSIN

Procedure

Road Log - The detailed road log and attached map indicate the route to be followed and the stops. A short description of each stop is included in the log and a leader will give a brief explanation at each locality. Blank spaces are provided adjacent to the mileage to allow cars without trip speedometers to note their mileages. Road log prepared by F. T. Thwaites, W. H. Twenhofel, I. C. Edwards, and C. A. Bays.

Driving - Except when under police escort the cars will travel as individuals, obeying all traffic signals, stop signs, and speed limits. Each car will be furnished with identifying red markers to be tied on the left side of the front bumper and on the left rear bumper. The lead car will drive at the logged rate and the other cars should follow. The road log is sufficiently detailed to allow any cars not in the procession to catch up or to follow the route. At important turns and stops flagmen will aid in handling traffic and their instructions should be followed.

Parking - A car will precede the Conference to all stops and at the stops flagmen will direct parking. At all stops on the highways care should be taken that all cars are well off the road. Lead car will sound horn 3 minutes before each departure. Each driver should always make sure that his passengers are accounted for.

Flagmen - At various places in the log there are turns marked for flagmen. All flagmen to be needed between stops should be in the advance car. 3 Flagmen should handle all traffic and parking at stops. One man should remain at head of procession, stop the cars, slow down cars coming the other way, and hold cars behind the lead car if turn-around is necessary. The others should move back along the procession slowing down cars and directing parking. At the turns and stops marked for flagmen a man should be dropped from the advance car. He will slow down other traffic and move the Conference cars past the turn or stop sign with as great safety as possible. He should note number of cars in line and catch a ride with a car near the rear or with the rear car. In places where the line is broken up by parking flagmen should direct its re-forming.

Leaders - Leaders Have been designated for each stop and they will make explanations and direct discussion at each place. In some cases time limits for each leader are designated in the log. Time limits in the field and at the evening meeting should be rigidly adhered to. The length of time at each stop will be followed exactly with horn blown for re-assembling in cars three to five minutes preceding departure.

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Parking
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for.

Flagmen
Flagmen to
should handle

ROAD LOG

Saturday, October 2

- 8:45 00.0 _____ Jct. of P with town roads east and west, south on P.
1.0 _____ Turn left, east, thru old railroad fill.
9:15 1.5 _____ STOP 1 - Railroad cut (30 min.)
(Sec. 24, T. 4 N., R. 15 E.)
Park on right hand side of road according to the instructions
of the flagmen.

Leader - F. T. Thwaites

9:45 The abandoned railroad cut shows a section of the Interlobate moraine between the Lake Michigan and Green Bay lobes. The material is excessively stony till intermingled with some sand and gravel. Over 90% of the stones are of local origin. Topography is very complex. The cut is at the east end of the Milton or second moraine which extends directly west from here. South of the cut the interlobate curves to the south and thence to the southwest dividing at Richmond (6 miles west of south) into Johnstown (Green Bay) and Darien (Lake Michigan or "Delavan") moraines, the endmoraines of the Cary substage of the Wisconsin stage of glaciation.

- 2.3 _____ Continue up hill on outwash plain
Turn left (east) on gravel road (on Heart Prairie). Heart Prairie is the outwash of the Green Bay lobe at the time of the Milton moraine. The ice was moving actively and till was deposited in the moraines including the interlobate to the northwest. The waters invaded territory recently vacated by the Lake Michigan ice so that pitted outwash was formed when the ice masses melted. The escaping waters eroded the Darien moraine forming the second outwash terrace along Turtle Creek which is a tributary of the Rock at Beloit. Heart Prairie is about 160 feet higher than the drumlin-ground moraine area at Whitewater.

- 5.6 _____ Turn right (south) on H; Elkhorn moraine ahead
6.2 _____ Turn left (northeast) on gravel road at Bird School. Cross Elkhorn moraine
The Elkhorn moraine, here about 3 miles wide, is the first recessional of the Lake Michigan lobe and is the same age as the Milton moraine. As mapped by Alden the Elkhorn was placed as part of the "Delavan lobe" which was considered as an offshoot of the Lake Michigan lobe. Under this interpretation both the Darien and Elkhorn moraines curved to the northeast near Lake Geneva. Recent mapping by the Illinois geologists shows that this is an error and that these moraines pass into Illinois in a southeasterly direction with no reentrant angle. Between the Elkhorn moraine and Eagle the route crosses the intensely pitted outwash formed in the Lake Michigan area by Green Bay waters during recession from the Milton moraine. The outlet was to the Rock River and the lowest terrace of Turtle Creek was then formed. This outwash terrace is Alden's No. 1 and is not bounded by a moraine to the east. The Lake Michigan ice may have then been stagnant, at least near its margin.

- 8.8 _____ Turn left (north) on 12
Flagman - should be dropped from advance car. Slow down traffic on 12 and direct Conference cars on turn.
- 9.0 _____ Continue north on 67, leaving 12
 Follow 67 through Little Prairie
- 15.7 _____ Leave 67, straight ahead (east) on MM
- 18.4 _____ Turn left (north) on NN
 Cross Eagle terraces; note contact of no. 1 and no. 2 terraces.

The main part of the village of Eagle is on Alden's No. 2 terrace which was formed when a lower outlet to the Fox River was made available by recession along Sugar Creek 10 to 12 miles south of Eagle. Southeast of Eagle the contact of this level with Alden's No. 3 terrace is well shown. This latest terrace was formed by the drainage which escaped directly east to the Fox River. All these terraces are extremely pitted indicating rapid formation in territory recently vacated by active ice. No. 3 terrace is continued to the north as the drainage outlet seen at North Prairie and thence north to near Wales. It is in this lowest terrace that the remarkable crevasse filling between two kettles is seen on the right of the route. Such topographic forms are frequently confused with eskers which occur in ground moraine.

- 19.7 _____ Turn right (east) on 99
 Cross creek; outcrop of Niagaran
- 20.9 _____ Jericho
 Turn left (north) on E.
- 24.6 _____ View of glacial drainage channel ahead at Prairie View School on No. 3 level; Interlobate beyond.
- 25.3 _____ North Prairie; ahead on E on No. 3 level.
 Pitted outwash terraces older than No. 3.
- 29.2 _____ Excellent crevasse filling on right (noted above)
- 29.5 _____ Continue north on 83
- 31.1 _____ Stop sign; cross 18; continue ahead on 83.
Flagman - should be dropped to slow down traffic on 18 and help Conference cars through the crossing. Move the Conference cars through without stopping unless these are cars on 18. Police escort may meet group at this point in which case flagman will do as directed by county officer.

10:45

- 34.2 _____ STOP 2 Outwash terraces near Delafield (30 min.)
 (Sec. 21, T. 7 N., R. 18 E.)
 Park on side of road. Leave cars in gear as well as with brakes on.

Leader - F. T. Thwaites

Around Delafield the terracing of the Interlobate reaches its maximum perfection. The deposits are almost all gravel rather than till and indicate deposition by streams within a constantly widening reentrant possibly between stagnant ice masses. The exact outlets of each terrace have not been ascertained. Some may have been over the ice and not the land. Some of the terraces were overridden by rejuvenation of the glaciers so that till now overlies gravel. At the stop Lake Michigan drainage escaped at first south to the no. 3 terrace and later southwest along U. S. 18 into an area vacated by the Green Bay glacier close to the foot of the Interlobate. Next the ice mass which lay in Lake Nagawicka melted down and opened a lower outlet to the Rock River

via Delafield. Terraces seen around the lake confirm this. This outlet had a steeper gradient and eroded down across the head of the older channel to the south leaving that hanging. During the later stages of this drainage the water appears to have come from an ice mass in the basin of Pewaukee Lake. North of Lapham Peak, just west of here, there is no real Interlobate moraine for an interval of about 7 miles. North of this gap initial stages in the formation of the interlobate deposits consist of moulin kames, conical hills of sand and gravel formed in holes in the ice apparently near or at the junction of the lobes. Such deposits indicate stagnant ice. Good examples are Holy Hill and Pulforts Peak (Sugar Loaf) seen to the right of the route later in the day.

11:15

34.0 _____

Ahead on 83.

Turn left (northwest) on 30

Flagman - This turn may be handled by police; otherwise a flagman should hold traffic on 30 and swing the Conference cars around the turn.

35.3 _____

Lake Nagawicka; outwash terraces

11:30

37.0 _____

Turn right (north) in Cushing Memorial Park (75 min.)

STOP3 - Lunch stop.

Park cars in parking area; water and rest rooms are west of the parking grounds.

Registration lists and final reservations for the banquet will be passed around during lunch.

Flagmen - should direct parking of cars so as to avoid congestion in the parking grounds. Those who forgot lunches should be informed that they may purchase food in Delafield a short distance east of the park. Sheets for registering and for taking reservations for the evening banquet should be passed around as quickly as possible.

12:45

37.2 _____

Turn right (west) on 30, paralleling interurban.

37.7 _____

Gravel pit in outwash terrace on left.

38.1 _____

Caution - interurban crossing.

38.3 _____

Slow - congested district

38.8 _____

Caution - interurban crossing

Cross pitted outwash plain

40.2 _____

Stop sign; turn right (north) on 67

Ahead on 67 across outwash plain

Flagman - should be dropped at this corner to slow traffic on 30 and hold northbound traffic on 67.

41.7 _____

Caution - interurban crossing

42.1 _____

Jct. 67 and P; keep left on 67.

43.3 _____

Oconomowoc city limits - 25 m.p.h.

44.1 _____

Stop sign; jct. with Z; ahead on 67

44.3 _____

Railroad crossing and sharp right turn; continue on 67

44.5 _____

Traffic signal; jct. with 19; ahead on 67 Flagman

44.8 _____

Lac La Belle on left

45.4 _____

Leave Oconomowoc

Area of drumlins ahead

48.7 _____

Monterey city limits - 25 m.p.h.

50.0 _____

Leave Monterey

51.7 _____

Dodge County Line

52.8 _____

Ashippun village limits

53.0 _____

Railroad crossing

- 53.8 _____ North limits of Ashippun
 Large area of drumlins for 3 or 4 miles
- 56.7 _____ View of drumlin country to north from Niagara outlier
- 59.6 _____ Neosho City Limits
 Large esker to right (east)
- 60.3 _____ Leave Neosho
- 61.0 _____ Stop sign; jct. 50 and 67; ahead on 67
 Neosho esker to left
Flagman
- 64.2 _____ Woodland city limits
 Jct. 109 and 67; ahead on 67
- 64.6 _____ Railroad crossing
- 66.0 _____ Leave Woodland
- 66.4 _____ Iron Ridge village limits
- 66.7 _____ 67 turns left; continue straight ahead (north) on black top
 street
Flagman
- 66.8 _____ North limits of Iron Ridge; continue north on gravel road
- 67.8 _____ Turn left (west)
Flagman - can walk back from advance car at stop.
- 1:35 67.9 _____ STOP 4 - Maquoketa (20 min.)(Sec. 13, T. 11 N., R. 16 E.)
 Park cars on right side of road so as to keep at least one clear
 lane for traffic. Leave cars in gear.

Leader - W. H. Twenhofel

The Maquoketa is found in exposures in the road ditch and consist of shales in which are thin beds of dolomite. Fossils are found more or less throughout and many of the dolomites are masses of organic material. The exposure extends through a thickness of 20 to 30 feet. This is one of the few exposures in the southeastern part of the state.

- 1:55 Flagmen - stop lead car east of railroad. One man should remain at head of line and another should be stationed at top of hill.
- 68.0 _____ Railroad crossing; turn right into Iron Mountain
 Old iron pits and smelter to right
 Continue straight north on gravel road.
- 68.8 _____ Old drift of Oliver Mining Co. to right.
- 2:00 69.0 _____ STOP 5 - Ore Pit (60 min.)
 (Sec. 12, T. 11 N., R. 16 E.)
 Park cars to right of road on wide shoulder. Walk through
 gates to ore pits.

Leaders - Ores - ^{C. K. Keith}~~F. T. Thwaites~~
 Stratigraphy - W. H. Twenhofel

The oolitic iron ore deposit beneath the Niagara dolomite was one of the first discovered in the northwest and its exploitation antedates that of much of the Lake Superior district. The ore is low grade, for the most part less than 45% iron, high in phosphorus, well over 1%, but rather low in silica. Its carbonate content makes it difficult to smelt alone so that it is now unused although large reserves are held by some of the major steel companies. The deposits form a series of lenticular masses, whose individual axes trend northeast - southwest but these lie along-side one another so that the district

as a whole trends toward the southeast. The ore rests upon a fairly even surface of the shale. A thin basal conglomerate contains iron oxide coated shale pebbles. The top few inches are hard black ore. Bedding is regular and horizontal with rather uncommon oscillation ripple marks and plunges abruptly down at the margins of the ore bodies. One of these pinches out just at the south end of the old pit. The variation in thickness of the ore is at the expense of the overlying dolomite but it is far from clear that an erosional unconformity intervenes. This ore is very similar to those of Lorraine, France, but is higher in carbonate and phosphate than those of Birmingham, Alabama.

3:00

Continue north on gravel road

69.6 _____ Stop sign; turn right on 67

Flagman

69.8 _____ Stop sign; jct. 67 and 33

Continue on 67

Flagman - direct Conference cars past this junction and remain at corner as cars will return and turn left on 33 as quickly as they are unloaded.

3:10

69.9 _____ Turn right into Ruedebusch Quarry

STOP 6 - Mayville and Byron (40 min.) (Sec.1, T. 11N., R. 16 E)

Keep cars in line; cars will be stopped and passengers unloaded. DRIVERS REMAIN IN CARS; as quickly as cars are unloaded they will be taken to the top of the section and drivers will walk down. Those not wanting to walk remain in cars and be taken to upper part of quarry.

Leader - Ira C. Edwards

The quarry is one of several in the area showing the basal Silurian beds. The greater part of the beds are Mayville. In the upper part of the quarry the Virgicera zone is exposed and is overlaid by the Byron. Some of the top ledges are glacially striated.

70.1 _____ Drive cars around loop
Turn left (south) into 67

Flagman

70.2 _____ Turn left (east) into 33

Flagman

70.3 _____ Underpass; climbing face of Niagara cuesta
Turn left (north) off 33 into gravel road to quarry

Flagman - should return to this post after stop. also.

Drive into quarry; turn around; park cars.

3:50

71.1 _____ Turn left (east) on 33

Flagman

Road cuts in Mayville and Byron for 2 miles

75.1 _____ Road cut thru drumlin

78.2 _____ Washington County Line

79.3 _____ Jct. with U; continue on 33

80.4 _____ Stop sign; jct. with 41

Continue past overhead crossing; turn sharp right.

Stop sign; continue south on 41.

83.1 _____ Jct. with 83; continue on 41

84.4 _____ St. Lawrence City Limits - 25 m.p.h.

84.9 _____ Leave St. Lawrence

High hill ahead and to right is moulin kame (Bulforts Peak or Sugar Leaf) near Hartford.

- 85.9 _____ Kettle Interlobate moraine ahead on skyline
 87.7 _____ Overhead crossing; enter Slinger - 25 m.p.h.
 Margin of Interlobate
 88.4 _____ Jct. with J; ahead on 41
 89.3 _____ Traffic signal; jct. with 90; ahead on 41
 89.9 _____ View of Holy Hill to right
 90.6 _____ Jct. 60 and 41; continue ahead on 41 (60 left)
 95.3 _____ Enter Richfield - 25 m.p.h.
 95.7 _____ Railroad crossing
 96.2 _____ Leave Richfield
 98.6 _____ Underpass
 99.8 _____ Jct. with 165; continue ahead on 41
 100.1 _____ Jct. with Y; turn right (southwest) on Y
Flagman
 100.9 _____ Road cut through Racine bioherm
 101.1 _____ Stop sign; jct. with V; continue ahead (south) on Y
Flagman
 102.3 _____ Quarry in bioherm to left
 103.9 _____ Lannon village limits
 104.0 _____ Railroad crossing
 104.1 _____ Stop sign; jct. with 74; turn left on 74
Flagman
 104.3 _____ Railroad crossing; 3 tracks
 Turn right into Lannon Stone Co. just past 3rd
 track
 Drive south past office, crusher, and across rail-
 road
 4:50 104.7 _____ Turn left into second quarry
 STOP 7 - Lannon Stone quarry (30 min.)
 (Sec. 17, T. 8 N., R. 20 E.)
 Drive cars down into quarry and park in circle.

Leader - Ira C. Edwards

Exposures in the Lannon quarries are entirely Silurian and are assigned to the Byron formation. This correlation is made largely on the basis of lithology as the rocks contain few fossils and these have not been carefully studied. The top beds of the quarries are beautifully striated by glacial action. Because of the excellent bedding planes, thickness of beds, and ease in trimming, the "Lannon stone" is extensively used throughout eastern Wisconsin.

5:20

- 104.8 _____ Turn left (south) on leaving quarry
 Turn right from quarry to gravel road into Lannon
Flagman
 105.3 _____ Turn left (southwest) on 74
Flagman
 107.7 _____ Jct. with V; continue to left on 74
 107.2 _____ Stop sign; jct. with V; overhead crossing
 Turn right on 74 just past overhead
Flagman
 108.3 _____ Sussex village limits
 108.4 _____ Railroad crossing; 3 tracks
 108.5 _____ Jct. 74 and 164; turn left (south) on 164
Flagman

- 110.0 _____ 164 turns left; jct. with K; continue on 164
 110.3 _____ 164 turns right (south); K ahead; continue on 164
 112.4 _____ Jct. with 16; ahead on ~~16~~ 164
 113.2 _____ Railroad crossing; 2 tracks
 114.4 _____ Junction; stop sign
 Continue on 164 which turns left and then right in 50 yds.
 Flagman
 115.9 _____ Jct. with 19 and 30; continue straight ahead on 164 under
 overhead crossing
 116.0 _____ Waukesha quarry which will be visited on Sunday morning to
 right
 Gravel pit in outwash to left.
 116.8 _____ Railroad crossing; Waukesha City Limits
 117.5 _____ Jct. with F; ahead on 164 (North St.)
 118.1 _____ Stop sign; jct. with 18; turn left on 18 (Broadway)
 5:50 118.4 _____ Traffic signal; 18 and 59 turn left; continue ahead on Broad-
 way for one block.
 Avalon Hotel on left

Parking: There is a public parking ground with police protection on Barstow St. (County Trunk F) 2 blocks northwest of the hotel, 3 garages within a block. The group will assemble on Sunday morning at the parking ground.

- 7:00 Banquet: In the dining room of the Avalon Hotel at 7:00 P. M. Following the banquet there will be a short business meeting and 4 brief talks on the region covered: (10 minutes each)
- Pleistocene - E. F. Bean
 - Devonian - Ira C. Edwards
 - Silurian - W. H. Twenhofel
 - Subsurface - F. T. Thwaites

Sunday, October 3

Assemble at Public Parking Lot on Barstow Street (County Trunk F) at 8:00 A. M. Cars should be lined up in parking area facing northeast. Departure will be promptly at 8:00. Baggage may be left in the hotel as most of those attending the Conference will find it convenient to return via Waukesha after the last stop.

- 8:00 .00.0 _____ Turn left across river on F
 Flagman
 0.2 _____ Railroad crossing; 2 tracks
 0.3 _____ Stop sign; turn right (north) on 164 (North St.)
 Flagman
 1.4 _____ Railroad crossing
- 8:10 2.0 _____ STOP 8 - Waukesha Quarry (40 min.)
 (Sec. 26, T. 7 N., R. 19E.)
 Park cars to left of highway next to crusher.
 Flagmen - direct parking and stop lead car past the stairway
 leading down into the quarry.

Leader - W. H. Twenhofel

The type exposure of the Waukesha formation is on the grounds of Carroll College and very little may now be seen. It has been assumed that the formation is represented in the quarry

at Waukesha. Crossing the north end of the quarry is a fault with the throw believed to be on the south. The minimum extent of the throw is 40 feet. It may be much greater. It is believed that the strata southeast of the fault may be correlated with the Byron formation. The strata northwest of the fault are thought to represent the lower Byron or Mayville, but it is also possible that they are inter-reef Racine. It seems likely that the strata in the type locality of the Waukesha formation are equivalent to some of those northwest of the fault.

- 8:50 2.2 _____ Turn left off 154 just south of overhead.
 2.3 _____ Turn right on 19 and 30 and cross on overpass
 4.7 _____ Stop sign; jct. with 18; ahead (east) on 18, 19, and 30.
 5.7 _____ Beginning of divided highway
 8.0 _____ Stop sign; turn half left on O and YY
Flagman
 8.6 _____ YY turns left; ahead on 00
 8.9 _____ Enter Elm Grove
 9.6 _____ Railroad crossing; double track
 10.0 _____ Leave Elm Grove; continue on O
 10.3 _____ Milwaukee County Line; 3 lane highway
 11.3 _____ Traffic signal; jct. with 45 and 100; turn left on 45 and 100
 over overpass
 12.4 _____ Traffic signal; jct. with M; ahead on 45 and 100.
 13.4 _____ Jct. with J; ahead on 45 and 100
 14.1 _____ Currie Park; City-County quarry in inter-reef phase of the
 Racine
 14.4 _____ Jct. with 16; continue ahead (north) on 45 and 100
 15.6 _____ Jct. with EE; continue ahead on 45 and 100
 16.7 _____ Jct. with E; continue ahead on 45 and 100
 17.8 _____ Jct. with 41; continue ahead on 45 and 100
 18.7 _____ 45 ahead; turn right on 100
 18.9 _____ Jct. with 55; ahead (east) on 100
 19.2 _____ Turn left (north) on 100
 21.2 _____ Jct. with F and 74; continue ahead (north) on F, leaving 100
 24.2 _____ Jct. with S; turn right (east) on S
 26.2 _____ Turn left (north) on town road
 29.2 _____ Turn right (east) on town road
 29.8 _____ Jct. with 57; turn right (south) on 57
Flagman
 30.0 _____ Railroad crossing
Flagman - watch for trains
 30.9 _____ Turn right across railroads to Thiensville quarry
- 10:10
 31.0 _____ STOP 9 - Thiensville Quarry (30 min.)
 (Sec. 10, T. 9 N., R. 21 E.)
 Park cars at quarry crusher.

Leader - Ira C. Edwards

The quarry exposes the Silurian-Devonian contact. The lower beds of coarse granular dolomite are Racine. The upper formation overlying an irregular contact is the Lake Church. South of this locality the Lake Church formation is overlapped by the Thiensville formation. The Thiensville type locality is in the road cuts on Highway 57 just east of the quarry. Raasch subdivided the Lake Church into two members, the Belgium

10:40

below and the Ozaukee above. The Belgium member is thin, usually less than 8 feet, and bears a number of fossils. The Ozaukee ranges up to 30 feet in thickness and is characterized by an abundant coral fauna.

Return to 57

- 31.1 _____ Turn right (south) on 57
- 33.3 _____ Thiensville
- 34.2 _____ Mequon
- 35.9 _____ Milwaukee County Line
- 36.9 _____ Traffic signal; jct. with 74 and 100; continue ahead (south) on 57
- 37.4 _____ Brown Deer
- 38.2 _____ River Hills
- 41.7 _____ Traffic signal; jct. with E; turn left (east) on E
- 42.6 _____ Traffic signal; turn right (south) on B
- 43.3 _____ Quarry in Silurian on right; underpass
- 43.6 _____ Stop sign; turn left (east) on Hampton Ave.
- 43.9 _____ Turn right (south) into Estabrook Park drive
- 45.6 _____ Railroad crossing

11:25

- 45.7 _____ Turn right (west) into parking grounds
- STOP 10 - Estabrook Park (30 min.)
(Sec. 4, T. 7 N., R. 22 E.)

Leader - Ira C. Edwards

The exposures along the bank of the Milwaukee River in Estabrook Park and in the old cement quarries on the west side of the river are the type locality of the Milwaukee formation (Alden). Cleland gave descriptions of faunal and lithological zones and Raasch applied member names to them. Zones A and B (Bertholet member) are at the base and consist of about 20 feet of gray dolomite containing numerous fossils including fish fragments. Zone C (Lindwurm member) is known to be about 35 to 45 feet of gray shaly limestone which weathers to a sticky gray clay full of fossils. Zones B and C are exposed at present in the east bank of the river. The top member of the formation (North Point) is not known in natural exposures.

4 min later

11:55

Cars line up near entrance to parking area

- 45.8 _____ Turn right (south) on park drive
- 46.5 _____ Turn right (west) on 16 (Capital Drive)
- 47.2 _____ Railroad crossing; 2 tracks
- 47.4 _____ Traffic signal; Pt. Washington Ave.; ahead on 16
- 47.7 _____ Traffic signal; Green Bay Ave.; ahead on 16
- 48.4 _____ Traffic signal; jct. with 57 (at N. 20th St.); ahead on 16
- 48.7 _____ Traffic signal; jct. with D (N. 21 st St.); ahead on 16
- 49.0 _____ Traffic signal; N. 27th St.; ahead on 16
- 50.5 _____ Jct. with 55; Fond du Lac Ave; ahead on 16
- 51.0 _____ N. 60th St.
- 51.8 _____ Jct. with 41; ahead on 16
- 52.0 _____ Jct. with P; turn left (south) on P (Wauwatosa Ave.)
- 52.5 _____ Wauwatosa City Limits
- 53.5 _____ Stop sign; turn right on Harwood Ave for one block.
- 53.6 _____ Turn left on State St. along railroad track
- Turn left after one block to Fuller quarry
- STOP 11 - Fuller Quarry at Wauwatosa (30 min.)
Sec. 22, T. 7 N., R. 21 E.)

12:25

8 min later

Park cars near quarry office, taking care to keep clear of railroad.

Leaders - Stratigraphy - Ira C. Edwards
Coral Reefs - W. H. Twenhofel

The strata exposed in the Fuller quarry are assigned to the Racine formation and they are representative of the highest Silurian in Wisconsin. The Racine is represented by two facies; one in which the strata are domed and evidently accumulated as reefs. The strata are without bedding or with extremely irregular bedding. The other facies of the Racine was deposited between the reefs. These strata are evenly bedded. Fossils are locally and horizontally present in abundance, but, in general, are not common. Many of the large collections made from the Silurian of eastern Wisconsin were derived from the reef facies and hence are only partly representative. Fossils from the inter-reef facies seem to have little representation in museum collections. In this quarry both the reef and a marginal portion of the inter-reef facies are present.

12:45

Return to Waukesha may be made by turning right at exit to quarry and following State St. to the Watertown Road (County Trunk O), at the foot of Wauwatosa Ave. Turn left (southwest) on O and follow to Elm Grove, retracing morning route to 18 and follow 18 directly to Waukesha.

For those interested another stop to show the even-bedded inter-reef phase of the Racine is arranged at the City-County quarry in Currie Park. Turn right into State St.

12:45 00.0 _____ One block to Harwood Ave.
0.1 _____ Turn right on Harwood Ave; one block
0.2 _____ Turn left into Wauwatosa Ave.
0.4 _____ Stop sign; Milwaukee Ave; ahead on Wauwatosa Ave.
1.0 _____ Traffic signal; turn left on North Ave.
2.2 _____ Turn right on W. Menomonee River Parkway
2.4 _____ Stop sign; Burleigh St.; ahead on Parkway.
3.4 _____ Jct. with 45 and 100; stop sign; turn left on 45 and 100

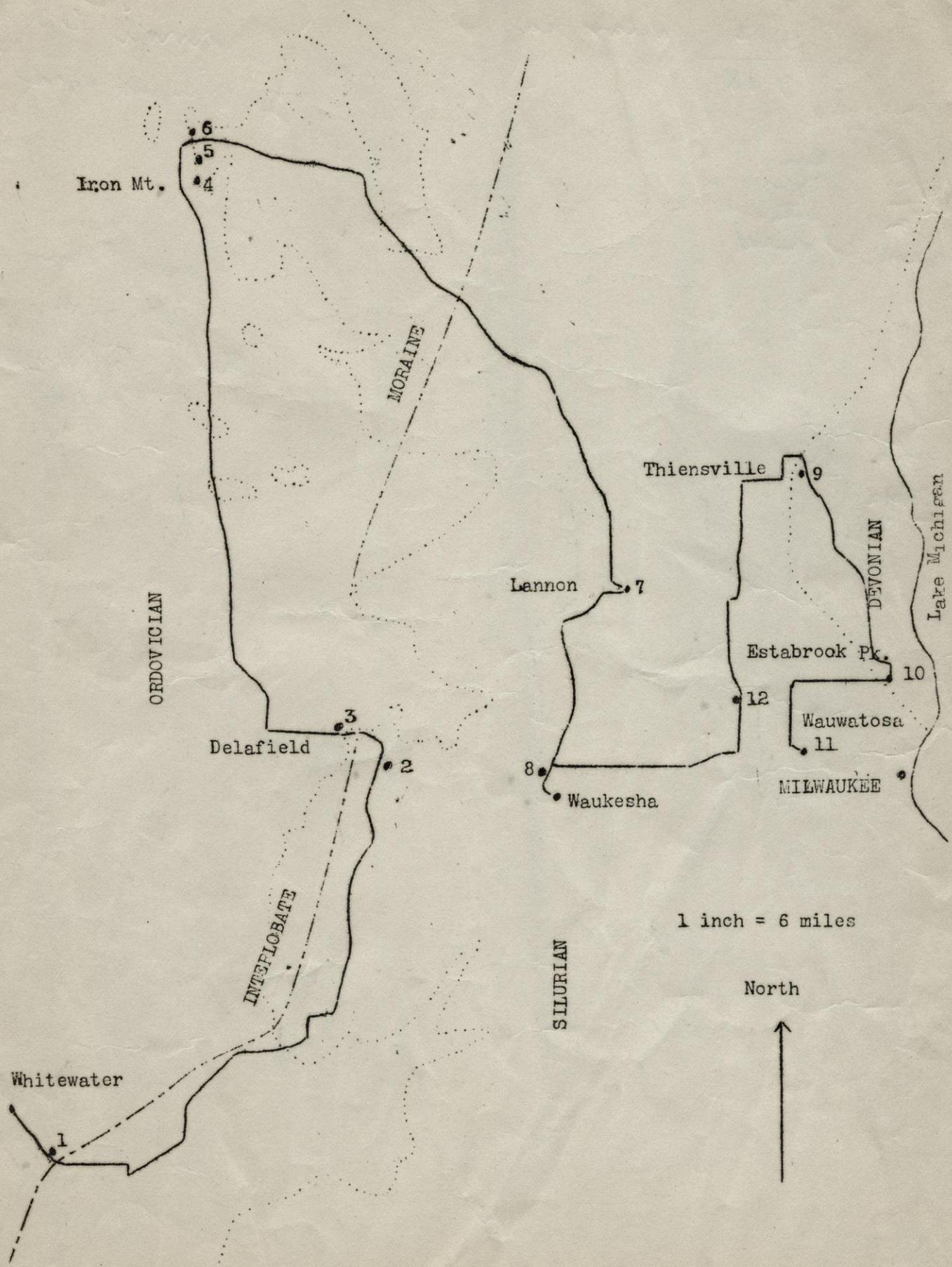
12:55 3.5 _____ Cross Menomonee River and turn right into parking ground of the Currie Park Quarry
STOP 12 - City-County Quarry (20 min.)

Leaders - W. H. Twenhofel and Ira C. Edwards

The strata exposed in the Currie Park quarry belong entirely to the inter-reef facies of the Racine. The even bedding and the somewhat uniform thickness of beds makes this rock excellent for building purposes. Most beds contain few fossils but one about 20 feet from the top of the quarry is frequently studded on the surface with tests of Calymene.

1:15

Turn right on 45 and 100 and re-trace morning route to 18 via Elm Grove and thus return to Waukesha.



Iron Mt.

MORaine

ORDOVICIAN

Thiensville

Lannon

DEVONIAN

Lake Michigan

Estabrook Pk.

Delafield

Wauwatosa

MILWAUKEE

Waukesha

1 inch = 6 miles

SILURIAN

North

Whitewater

2 Telephone calls 0.50
 3.65
 5.03

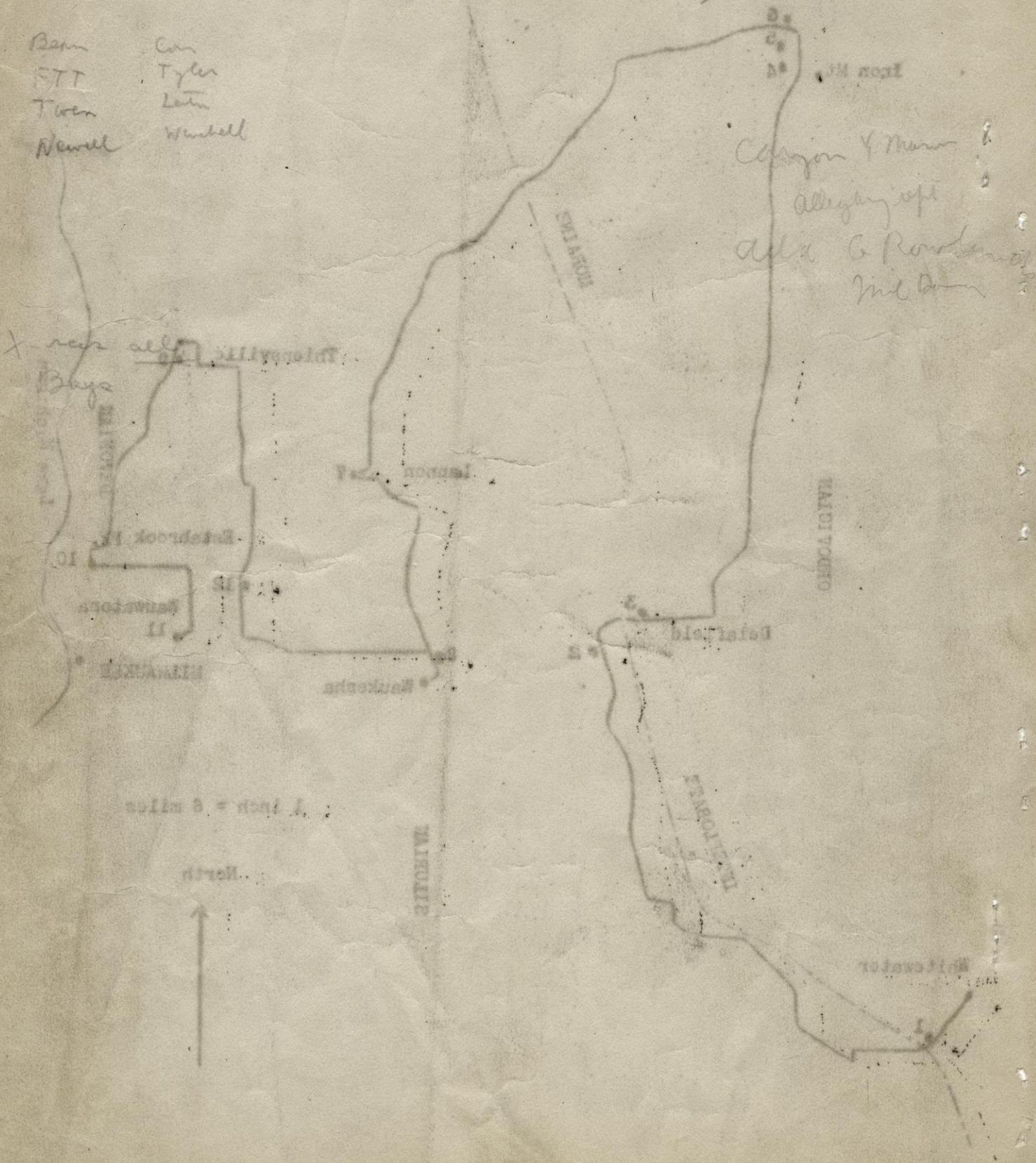
 9.18

Frederick car
 Wilcox car

W. L. Ray
 Carroll College
 2 other 8-see

Barn
 STT
 Town
 Newell

Can
 Tyler
 Linn
 Wendell



1 inch = 6 miles

North



September 20, 1937

Dr. Ira Edwards
Milwaukee Public Museum
Milwaukee, Wisconsin

Dear Ira:

In reply to yours of September 16th, Mr. Bays has already sent copy of the log of the trip giving time and expected arrival. We would be very pleased if you will take care of the matter of police escort in Milwaukee county and Milwaukee city in case the county officers cannot take care of that also, which I should think they could. With regard to Ozaukee county, it is probable that the Milwaukee county officers can ask permission to go with us. We will have to have permission from the Sheriffs of both counties, as I understand it. Mr. Bean is to arrange for a police escort for the part of the trip in Waukesha county. We will also have a police escort in the city of Waukesha, but we will take care of that.

Very truly yours,

PTT:N

F. T. Thwaites

IOWA STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS
AMES, IOWA

October 10, 1938

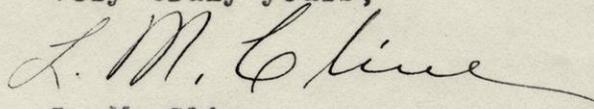
DEPARTMENT OF GEOLOGY

Dr. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

Dear Dr. Thwaites:

Since I have received several replies from Madison, I see that you have already distributed the announcements of the Tri-State Field Conference. I trust that you will see that these announcements are distributed to interested parties throughout the state.

Very truly yours,



L. M. Cline

LMC:EZ

Dear Mr. Cline

Enclosed please find such reply blanks for
the Tri. State as have come to me. They number
twelve but several say they sent ones direct
to you. Besides there are three others who will
not know until Wednesday.

I greatly regret that I cannot go myself
but the pressure of personal affairs growing out of
the death of my mother a short time ago
makes it impossible to leave town. Mr. Bean
also sends regrets.

I am attending to transportation problems.

Since I have received several replies from Madison,
I see that you have already distributed the announce-
ments of the Tri-State Field Conference. I trust
that you will see that these announcements are dis-
tributed to interested parties throughout the state.

Very truly yours,



J. M. Cline

LMC:ES

October 24, 1938

Mr. L. M. Cline
Department of Geology
Iowa State College
Ames, Iowa

Dear Mr. Cline:

Enclosed please find such reply blanks for the Tri-state as have come to me. They number twelve but several say they sent ones direct to you. Besides there are three others who will not know until Wednesday.

I greatly regret that I cannot go myself but the presence of personal affairs growing out of the death of my mother a short time ago makes it impossible to leave town. Mr. Bean also sends regrets.

I am attending to transportation problems.

Yours truly,

Dr. F. T. Shwaites

ftt/ed
enc.

IOWA STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS
AMES, IOWA

June 4, 1937

DEPARTMENT OF GEOLOGY

Prof. A. T. Thwaites
Dept. of Geology
University of Wisconsin
Madison, Wisconsin

Dear Professor Thwaites:

I have your letter of June 2 with regard to the dates for the field conference. I believe this letter should have gone to Dr. Tester at Iowa City since he is a member of the committee and I am not a member of the committee. I am forwarding the letter on to Dr. Tester.

Very truly yours,

John T. Lonsdale
John T. Lonsdale
Professor of Geology

JTL:dd

cc - A.C. Tester

THE STATE UNIVERSITY OF IOWA
IOWA CITY
DEPARTMENT OF GEOLOGY

June 8, 1937

PLEASE ADDRESS
REPLY TO WRITER

June 5, 1937

Professor A. C. Tester
University of Iowa
Iowa City, Iowa

Dear Sir:

In reply to yours of the 5th, it is evident that we were under a misapprehension as to the Iowa member of the Committee for the Tri-State Conference, for which please accept our regrets.

I realized when I had the Big Ten football schedule in front of me that there would be some objection from Iowa. It so happens that on the date selected there are no home games at any other university from which people come to the Tri-State Conference. However, if this is your homecoming,--and it is not stated in the official list which games are homecomings,--suppose we consider the 2d of October. This is the period of practice games and every university has a home game but they are not of a measure of importance. Otherwise, the dates which you suggested are hopeless to others. For instance, the 16th is our homecoming. The only objection I had to as early a date is that there will be heavy traffic in the Milwaukee district thereby increasing the danger to our party. But this may not be a serious item.

Very truly yours,

FTT:N

F. T. Thwaites

why to Sutton

THE STATE UNIVERSITY OF IOWA
IOWA CITY

DEPARTMENT OF GEOLOGY

PLEASE ADDRESS
REPLY TO WRITER

June 8 1937

June 5, 1937

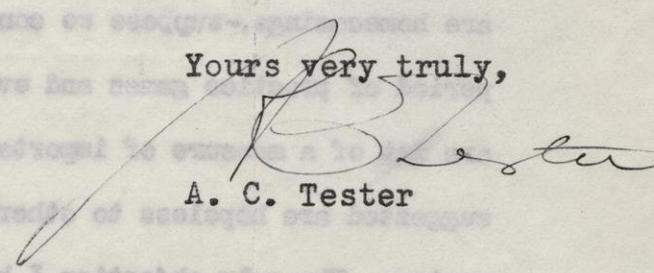
Prof. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

Dear Professor Thwaites:

Your letter of June 2 addressed to Professor Lonsdale at Ames has been forwarded to me for reply, as indicated by Lonsdale's letter to you of June 4.

I recognize the difficulty that is at hand in the fixing of a date for the Tri-States Field Conference next fall. However, the date that you have selected is particularly bad for Iowa, and it is doubtful if there could be a decent representation from this state on that date. I will appreciate your making every attempt to change this time.

Yours very truly,


A. C. Tester

ACT:A

I suggest Oct 30 - or 16th

INTERCOLLEGIATE CONFERENCE

Office of the Commissioner of Athletics

Hotel Sherman

Central 2824

Chicago

May 27, 1937.

John T. Lonsdale
Iowa State Coll

Amer Ia

Mr. F. T. Thwaites,
Department of Geology,
University of Wisconsin,
Madison, Wisconsin.

Dear Mr. Thwaites:-

Replying to your letter of May 27th, I am
sending you herewith copy of the 1937 Big Ten Football
Schedule.

Yours very sincerely,

John L. Griffith
John L. Griffith.

JLG:F

AH Sutton,

Voy Ill.

June 2, 1937

Professor A. H. Sutton
Department of Geology
University of Illinois
Urbana, Illinois

Dear Professor Sutton:

Yours of April 13th reached me while I was in the field at Devils Lake. Since then there has been just one field trip after another so it was only the last few days that I could get around to the matter of the Tri-State conference. I then wrote the Commissioner of Athletics at Chicago and obtained the 1937 football schedules. Study of these shows that the dates of October 23 and 24 will have the least objection. There is a Michigan game at Iowa, but that is all. If this date is satisfactory to you, I will go ahead and prepare a preliminary announcement for the Conference which is to be held in southeastern Wisconsin with night stop at Waukesha.

The subjects of investigation will be the Silurian, Devonian and Pleistocene.

If I do not hear from you to the contrary, I will assume that this date is satisfactory. I will be pleased if you will notify other institutions in your state.

Very truly yours,

FTT:N

F. T. Thwaites

June 2, 1937

Professor John T. Lonsdale
Iowa State College
Ames, Iowa

Dear Professor Lonsdale:

At the request of Professor Sutton I have fixed the week end of October 23-24 for the Tri-State field conference. The only football game which will interfere is Michigan at Iowa City, but it was impossible to arrange a date which would suit everyone. The Conference will be held in southeastern Wisconsin with night stop at Waukesha. We will endeavor to show the Silurian, Devonian, and Pleistocene of that area.

If I do not hear from you to the contrary I will assume that the date is satisfactory and will get out announcements as soon as practicable.

I will be pleased if you will notify the other institutions in your state of the choice of date.

Very truly yours,

FTT:N

F. T. Thwaites

The University of Chicago

Department of Geology

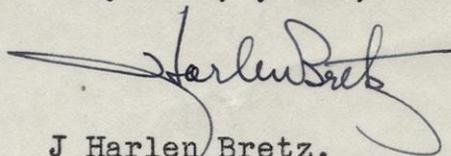
June 16, 1937

Dr. F. T. Thwaites,
Department of Geology,
University of Wisconsin,
Madison, Wisconsin.

Dear Dr. Thwaites:

I wonder if it will be feasible to change the announced dates of October 2 and 3 for the coming Tri-State Field Conference. Classes in our Autumn Quarter do not begin until October 4 and it will be difficult therefore for this department to make contacts with all of its students and organize plans for attendance of as large a number as we are accustomed to send. A week later would suit us very much better.

Very truly yours,



J Harlen Bretz.

71
50
4 87 32
58

1937 BIG TEN FOOTBALL SCHEDULE.

Sept. 25- Ohio U. at Illinois
Butler at Purdue
Iowa at Washington (Seattle)
N. Dakota State at Minnesota
S. Dakota State at Wisconsin
Texas Christian at Ohio State
Centre College at Indiana.

TRI STATE
Oct. 2- Chicago at Vanderbilt
DePaul at Illinois
Michigan State at Michigan
Minnesota at Nebraska
Purdue at Ohio State
Marquette at Wisconsin
Iowa State at Northwestern.

out
Oct. 9- Wisconsin at Chicago
- Notre Dame at Illinois
Indiana at Minnesota
- Michigan at Northwestern
Carnegie at Purdue
Ohio State at Southern California
Bradley at Iowa.

out
Oct. 16- - Princeton at Chicago
Illinois at Indiana
- Iowa at Wisconsin
Minnesota at Michigan
- Purdue at Northwestern.

for TRI STATE
Oct. 23- Indiana at Cincinnati
Michigan at Iowa
Northwestern at Ohio State
Wisconsin at Pittsburgh.

PHY
Oct. 30- - Ohio State at Chicago
- Michigan at Illinois
Indiana at Nebraska
Iowa at Purdue
Notre Dame at Minnesota
- Northwestern at Wisconsin.

and Ph
PHY
Nov. 6- Chicago at Michigan
- Illinois at Northwestern
Indiana at Ohio State
- Minnesota at Iowa
Purdue at Fordham.

Nov. 13- *no* Beloit at Chicago
no Illinois at Ohio State
Indiana at Iowa
Michigan at Pennsylvania
Northwestern at Minnesota
- Purdue at Wisconsin.

Nov. 20- - Chicago at Illinois
Purdue at Indiana
Iowa at Nebraska
Ohio State at Michigan
Wisconsin at Minnesota
- Notre Dame at Northwestern.

June 18, 1937

Prof. J. Harlen Bretz
Geology Department
University of Chicago
Chicago, Illinois

Dear Dr. Bretz:

In reply to yours of the 16th, the matter of the date for the Tri-State Conference has been discussed for some time with the football schedule of the Big Ten in front of us. The week end of October 9 is out because of important games at Illinois, and Northwestern plus the Mineral Industries conference at Urbana. The week end of October 16 is similarly out because of three major games: Chicago, Wisconsin and Northwestern. The 23d is the date that suited us best but this was eliminated because of the Michigan game at Iowa, which aroused their opposition. October 30 is impossible because of games at Chicago, Urbana and Wisconsin. On November 6th there are games at Northwestern and Iowa. November 13th there is an important game at Wisconsin, but nothing anywhere else, but the date is so late that I think that alone excludes it, and of course the 20th is much too late. It, therefore, seems as if either Chicago or Iowa would have to make the best of it. If it is impossible for you to contact your students in time, I shall have to reopen the matter with Iowa, but no matter what date we choose someone will find it inconvenient. Last year the Conference was on our Homecoming date, and inasmuch as football schedules are made up without regard to the demands for serious work I don't see much that we can do about it.

If you will let me know how you feel about the matter I will hold up definite decision until I hear from you.

Very truly yours,

FTT:N

F. T. Thwaites

The University of Chicago

Department of Geology

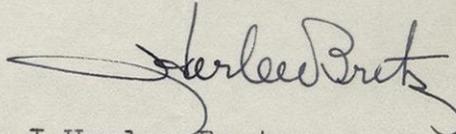
June 23, 1937

Dr. F. T. Thwaites,
Department of Geology,
University of Wisconsin,
Madison, Wisconsin.

Dear Dr. Thwaites:

Considering the difficulties you have encountered with the football schedule I think it best that we at Chicago endeavor to make contacts with our students before they return here in October and try to get our quota in that way. If you will send me 50 of the mimeographed outlines of the itinerary three weeks before the conference is held, addressing them to me at the University of Chicago, I will send them out to all those who should be circularized from this department and add the appropriate information regarding our own departmental arrangements.

Very truly yours,



J Harlen Bretz.

June 17, 1937

Professor A. C. Tester
University of Iowa
Iowa City, Iowa

Dear Professor Tester:

In reply to yours of June 10th, I believe that the Tri-State Conference will have to be on October 2 and 3, as I have heard no objection from Illinois.

Yours very truly,

FTT:N

F. T. Thwaites

C to Dr. Sutton

THE STATE UNIVERSITY OF IOWA
IOWA CITY

DEPARTMENT OF GEOLOGY

PLEASE ADDRESS
REPLY TO WRITER

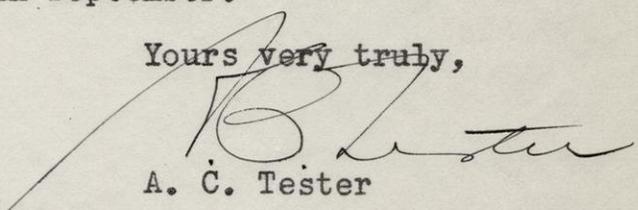
July 6, 1937

Prof. F. T. Thwaites
Department of Geology
University of Wisconsin
Madison, Wisconsin

Dear Thwaites:

Thank you for your letter of June 17 in which you advise that the Tri-State Field Conference has been set for October 2 and 3, 1937. Unless I hear from you to the contrary, I will make the necessary announcements in Iowa and will plan for the dates as advised. Any information which you can supply indicating the route of the trip and a few general facts to be covered will be useful. I plan to circularize this field conference during the summer as well as early in September.

Yours very truly,



A. C. Tester

ACT:A

Dictated July 3.

ELEVENTH TRI-STATE GEOLOGICAL FIELD CONFERENCE
Eastern Wisconsin
October 11 and 12, 1947

General Information

Road Log.--The road log indicates the route to be followed and the stops that will be made. A short description of each stop is included and a leader will give a brief explanation at each stop. Blank spaces are provided adjacent to the mileage readings to allow cars without trip odometers to note their mileages. Road log prepared by F. T. Thwaites, W.H. Twenhofel, and L. M. Cline.

Driving.--Except when under police escort we will travel as individual cars, obeying all traffic signals and not exceeding 45 M.P.H. To help you keep track of cars in the caravan, each car will have a piece of red cloth attached to the bumpers. If you become separated from the group the road log is sufficiently detailed to keep you on the conference route. Keep procession closed up. Do not change your order in it.

Parking.--Flagmen will direct parking at some of the stops but where parking is alongside the highway please park well off the pavement, get out of car on right side, and be careful in crossing highway.

Leaders.--At each stop leaders will make explanations and direct discussion. Assemble around the leader as promptly as possible as time limits have been set for each stop.

Lunch stop Saturday.--There will be a one hour lunch stop at Lakeside Park in the northern part of Fond du Lac where there are picnic facilities.

Saturday night stop.--The Hotel Manitowoc will serve as group headquarters Saturday night.

Annual dinner.--The banquet will be held at 7:00 P. M. at Bricks Restaurant.

Sunday morning assembly.--The assembly point is reached by driving north on U. S. Highway 42 about one mile north of the business district to Waldo Blvd. and turning left (west). Line up on the north side of the boulevard with the head of the procession at 11th street. Time of departure 8:00 A.M.

Final Stop.--The final stop will be at High Cliff Park, near Sherwood on the northeast side of Lake Winnebago, after which the conference will disband. We should arrive at High Cliff at 12:00 noon. There are picnic facilities for those who bring lunches.

ROAD LOG

Saturday, October 11

ASSEMBLY POINT.-- Main Street of Iron Ridge, Wisconsin, 8:30 A.M.
Line will form north of where Highway 67 leaves Main Street in residential area. Head cars north.

- 00.0 Zero your odometer opposite Iron Ridge village hall (on left).
Travel north along main street. Loose gravel.
1.3 Turn left (west) following phone line. SLOW.
1.5 STOP 1 - Road ditches near crest of hill.

Leader - W. H. Twenhofel

The Maquoketa shale and dolomite exposed in ditches on both sides of the road contains a fauna of upper Ordovician age. Species of brachiopods belonging to the genera Rhynchotrema, Hebertella, Platystrophia and others, and the bryozoa present at this locality show the Maquoketa to belong to the Cincinnati series. The calcareous shales in the vicinity of Cincinnati, Ohio, are world famous for their abundant and well preserved fossils and, in general, rocks of this age contain numerous well preserved fossils throughout the continental interior where a shallow seaway existed between the Appalachian and Cordilleran geosynclines. The Maquoketa thus affords a good stratigraphic datum from which to start this trip.

Note old iron ore workings to north and ruins of charcoal furnace.

- 1.7 Turn right after crossing R.R. and go north through Neda. Note iron ore workings at foot of Niagara escarpment on right (east).
2.5 STOP 2 - Abandoned strip mine of Northwestern Iron Co. Park on right only and walk into pit over strip dumps going through gates.

Leader - W. H. Twenhofel.

The iron ore lies in lenticular bodies attaining a maximum thickness of about 30 feet and with long axes trending NE-SW. One limit of this body lies a short distance south of the pit; it is not known to be connected with the ore worked farther south. Bedding dips down abruptly at the edge of the ore body. The bottom of the ore contains shale pebbles, many of which have a high polish which some geologists think is desert varnish. There are large reserves of ore, some of which analyzes about 40% iron, but because of its high phosphorous content and friable nature which permits it to blow out of the stack of a furnace, it is non-commercial at present. Between the oolitic ore and the overlying dolomite is a few inches of richer black ore. In physical appearance and geologic occurrence, the oolitic ore closely resembles the Clinton iron ore of early Niagaran (Silurian) age which is distributed from the Birmingham, Alabama, district northeastward into New York state, and, like it is calcareous. The Wisconsin ore has been referred to the Niagaran by some geologists. However, the ore lies below the Mayville dolomite of Alexandrian age (see the Silurian stratigraphic section) and above the typical Maquoketa shale of upper Ordovician age.

- Continue north.
- 3.1 _____ Join State Highway 67.
- 3.3 _____ Junction of State Highways 67 and 33. Turn right (East) up Niagara escarpment.
- 3.8 _____ Turn left (North) into quarry road keeping left inside gate. Continue on quarry road. Drive with caution.
STOP 3. - Approximately 40 minutes will be allowed at this stop.

Leader. - W. H. Twenhofel.

The stratigraphic section exposed in this quarry ranges from Mayville (Alexandrian) at the base, to Byron (basal Niagaran), at the top. The topmost layers of the Mayville are abundantly fossiliferous with the internal molds of Virgiana, a pentameroid brachiopod related to Pentamerus, Stricklandia, and Conchidium. Some geologists would refer to the Virgiana zone as a biostrome.

SILURIAN SECTION

	<u>Wisconsin</u>	<u>Illinois</u>	<u>Upper Michigan</u>
Cayugan	--?-- Waubakee		Bass Island (St. Ignace) Salina (Pointe aux Chenes)
<hr/>			
	Guelph	Guelph	
	Racine	Racine	Engadine
			Cordell
	Manistique	Bellwood	Manistique
Niagaran	Cordell (upper coral) Schoolcraft (lower coral)	Joliet	Schoolcraft
			Hendricks
	Burnt Bluff	Rockdale	Burnt Bluff
	Byron		Byron
<hr/>			
Alexandrian	Mayville		Mayville
		Brassfield (Kankakee)	Manitoulin
		Edgewood (Channahon Essex)	

- Continue through quarry, returning to main road at bottom.
- 4.6 _____ Turn right (west) to junction with 67.
- 4.8 _____ Turn right (north) on 67.
Niagara escarpment with old flux quarry to right.
- 8.6 _____ Mayville. Turn right at traffic light on to Highway 28.
- 9.6 _____ Slag dump on left. Note drumlins. A well drilled at the old coke plant reached the Pre-Cambrian at a depth of 1140 feet.
- 14.3 _____ Theresa. Turn left (N) on to Highway 41. Well at cannery reached Pre-Cambrian quartzite at depth of 920 feet.
- 26.9 _____ Turn left into quarry of Fond du Lac Stone Co.
STOP 4. Fond du Lac Stone Quarry. Park in quarry as directed. Approximately 20 minutes allowed here.

Leader. - W. H. Twenhofel.

The dolomite is the Byron formation which has been stated to rest on a number of reefs in the underlying Mayville. The irregular dips have been explained as due to deposition over the irregular upper surface of reefs. The Byron is assigned a stratigraphic position above the Mayville and below the Hendricks but there is a possibility that this thin-bedded dolomitic limestone is the inter-reef facies of one of the reef limestones.

- 27.2 _____ Leave quarry and turn left (N) on Highway 41.
- 28.2 _____ Descend Niagara escarpment. We will soon be entering the red drift of the Valders substage.
- 31.8 _____ Fond du Lac city limits. Keep on following Main Street.
LUNCH STOP. One hour will be allowed. If you did not bring your lunch there are several restaurants and a good cafeteria. Those with lunches continue north on Main Street.
- 34.8 _____ Lakeside Park, Picnic tables, rest rooms. Cars will line up here after lunch headed east.
FOOD FOR THOUGHT - "Hard rock" geologists take comfort in the fact that Fond du Lac overlies a buried range of Pre-Cambrian quartzite and slate. "Soft rock" geologists take comfort in the fact that it is completely buried.
- 35.2 _____ Continue on park road across bridge.
- 35.5 _____ Turn left (E) on Winnebago Drive, Highway 55.
- 39.0 _____ Leave Highway 55, keeping right into Peebles.
- 39.3 _____ Up Niagara escarpment on county road UU leaving the red till area. Fresh grading shows gray till of Cary substage (see Pleistocene classification next page)

THE PLEISTOCENE GLACIAL AND INTERGLACIAL STAGES
IN NORTH AMERICA

The Pleistocene glaciations and interglacial intervals are here classified as follows (after Thwaites):

Wisconsin glaciation* (Mankato glaciation**
(Valders glaciation**
(Two Creeks interstadial
(Cary glaciation
(Tazewell glaciation
(Iowan glaciation

Sangamon interglacial interval

Illinoian glaciation

Yarmouth interglacial interval

Kansan glaciation

Aftonian interglacial interval

Nebraskan glaciation

* Subdivisions as yet uncertain

** May be essentially the same age.

39.5 _____ Keep ahead.

40.3 _____ Drumlin with N-S axis on right. Note vertical bedding in
folded gravel and silt in nose.

41.0 _____ Southwest trending drumlin ahead.

42.2 _____ Turn right (S) up steep hill.

42.5 _____ STOP 5. On crest of southwest trending drumlin.

Leader. - F. T. Thwaites.

Various attempts have been made to explain the N-S and NE-SW drumlin trends. One idea is that some are overridden moraines. Another hypothesis relates them to change in ice direction due to growth of the Green Bay lobe. Another suggestion is that the SW drumlins are older and were formed when the Lake Michigan lobe was larger than it was during the Cary substage.

Ice of the Green Bay lobe then covered the area and built the N-S drumlins of which some occur on top of the SW ones. If this idea is correct the centers of the SW drumlins should contain pebbles derived solely from the Niagaran dolomite. Deep cuts will be necessary to test this hypothesis and thus far none has been made.

Continue south.

- 44.8 _____ Turn left (E) on to Highway 23.
50.0 _____ County gravel pit in kame on left.
58.2 _____ Just east of Greenbush turn right (S) on to County Road "A" and ascend the Kettle Moraine. The more rugged portions of this famous moraine are wholly gravel. Rather than two coincident end moraines, the bulk of the Kettle Moraine is due to confined drainage in the interlobate angle of the Green Bay and Michigan lobes of the Cary ice. Many masses of stagnant ice were buried in the gravel. There is every gradation between marginal gravels with poor sorting and true pitted outwash plains and terraces of well-sorted fine gravel.
59.6 _____ STOP 6. By side of large kettle. 10 minutes allowed.

Leader. - F. T. Thwaites.

Hill to SW is probably the filling of a moulin. Such moulin kames are very prominent a few miles to the SW and include some of the best-known hills of the moraine.

- 60.1 _____ Turn left (E) on gravel road and cross the pitted outwash terrace and descend from the moraine.
65.1 _____ In Plymouth turn left (N).
65.2 _____ Turn right (E).
65.3 _____ CAUTION. Turn left (N) across grade crossing.
65.4 _____ Join Highway 57 and go north across Kettle Moraine. Rocky Knoll Sanitarium at right. Well shows 215 feet of drift; total depth 525 feet in the Niagaran. Many kettles, gravel pits, terraces.
69.0 _____ Elkhart Lake. Keep ahead.
77.9 _____ Kiel. Keep ahead on 32.
79.1 _____ Turn right (E) on to Highway 149 following pavement. Continue through gravel terraces and kettles, some of the less spectacular parts of the moraine.
84.3 _____ Turn left (N) on County Road "A" following pavement.
87.5 _____ Prominent ridge of gravelly moraine on left.
88.8 _____ St. Nazianz Catholic school. Note old country style monastery to north on left.
89.3 _____ Reenter red or Valdres drift.

- 92.0 _____ Join Highway 151 and turn right (E).
94.5 _____ In Valders turn left just before crossing RR and continue on gravel road to just short of canning factory. Cross track and continue north.
95.3 _____ STOP 7. Quarry of Valders Lime and Stone Co. Park near office. 25 minutes allowed for this stop.

Leaders. - W. H. Twenhofel and F. T. Thwaites.

Quarry shows reef rock between even layers above and below. The reef (Racine formation) apparently is responsible for the preservation of the hill. The rock contains tabulate and rugose corals. On top of the rock at both north and south ends of the east quarry face both red and gray tills occur and the rock is grooved by south-trending striae. In the center, near the old road, the gray till is absent and the red or Valders till rests directly on bed rock; here E-W striae also occur. Their relation to the grooves made by the earlier ice show that the Valders ice was moving west contrary to views once expressed.

This is the type locality of the Valders drift, which drift may or may not be equivalent in age to the Mankato drift of Minnesota. The high clay content of the Valders drift in Wisconsin is due to plowing up of lake clays which were deposited in the sub-interval (Two Creeks) which preceded it. The red color of the drift is due mainly to iron oxide, originally derived from the red rocks of the Lake Superior basin and then concentrated in the lake clays; a part of it may have been derived directly from bed rock because of a change in ice movement.

At a depth of 625 feet the village well had not reached the base of the Niagaran.

- 96.2 _____ Rejoin Highway 151 and turn left (NE).
99.3 _____ Gary moraine partly buried under red till.
106.0 _____ Stop sign. Keep ahead on 151.
107.7 _____ Turn left (N) on to 21st Street. Continue north across Manitowoc River. Cement works at right is supplied with high calcium limestone from the Devonian at Calcite, Michigan, and with dolomitic clay washed from the gray till. North of river keep north on 18th Street.
109.2 _____ Waldo Boulevard superhighway. Turn right (E) on Highways 10 and 141.
109.9 _____ Junction Highway 42. Keep ahead to shore of Lake Michigan.
114.7 _____ Two Rivers. Keep to beach road and continue on 42 through Main Street. Base of Niagaran at depth of 770 feet.
115.2 _____ Turn right (E) on Highway 42 across East Twin River.

- 115.6 _____ Turn left (N) on 42. Seventeen-foot Nipissing beach seen at right near city hospital.
- 126.2 _____ Two Creeks. Turn right (E) on gravel road and go toward lake.
- 127.1 _____ Ball Park. Park here for STOP 8. Section exposed southward for $\frac{1}{4}$ mile along lake shore.

Leader. - F. T. Thwaites.

Pleistocene Succession Exposed in Cliff Along Shore

Top

6. Varved clays of glacial lakes.
5. Red Valders till.
4. Silt containing snail shells and spruce logs.
3. Peat and remains of spruce forest.
2. Varved clays of early Lake Chicago.
1. Cary gray till.

Contacts of Cary and Valders deposits are known in thousands of cuts in eastern Wisconsin but no interglacial vegetation has been discovered except at this locality and in the Fox River valley. This is the better known locality. The demonstrated history included: (a) a recession of the Cary ice from Lake Michigan with (b) a deposition of varved clays, (c) freeing of the Straits of Mackinac of ice with a consequent lowering of water level to one below the present as shown by drowned valleys from Milwaukee southward, (d) invasion of vegetation to form the forest bed, (e) drowning of the forest bed by waters from advancing ice before the Straits were again blocked, and (f) the advance of ice which knocked down live trees and deposited the red till.

The known organic remains indicate a cooler climate for the interstadial than Wisconsin has today, one more like that of northern Minnesota. The absence of a soil profile is mainly the result of low swampy ground. Note bleaching of red clays adjacent to organic matter. Also note change in outlet of the little creek because of shore and stream erosion.

Return to Manitowoc.

- 146.2 _____ Hotel Manitowoc. Headquarters.
- At 7:00 P.M. there will be a dinner at Bricks Restaurant (3rd floor) across the street from Hotel Manitowoc. After the dinner Professors Twenhofel and Thwaites will review some of the day's geological highlights.

Sunday, October 12

Breakfast. Arrangements have been made with some of the restaurants to open early enough to allow the group to eat, assemble, and depart by 8:00 A.M.

ASSEMBLY POINT. - To reach assembly point follow U. S. Highway 42 north from business district one mile to Waldo Blvd. Turn left (W). Head of caravan at 11th St.

- 1.9 _____ Turn right (N) on Highway 10.
- 3.7 _____ Turn left (W) on Highway 10.
- 5.6 _____ Buried moraine begins. The Valders seems to have made no moraines of its own and the till is not thick enough to conceal older topography.
- 13.8 _____ Grimms. Keep left leaving 10.
- 14.6 _____ Cross roads. Park in the village as directed.
STOP 9. Quarry of Western Lime and Cement Company is approached from road leading south. Climb to top in woods on south side and proceed to highest point of face.

Leaders. - F. T. Thwaites and W. H. Twenhofel.

Note the striae which appear to be the product of the Valders (red) ice. Note their relation to knob which demonstrates low viscosity of ice. The quarry is in the Upper Coral or Cordell member and shows nearly all reef rock.

Return to cars and go north to rejoin main highway.

- 14.8 _____ Join Highway 10 and turn left (W).
- 17.1 _____ Keep right on Highway 10.
- 23.6 _____ STOP 10. Quarry at Brillion. Park on right side of street and walk into quarry.

Leaders. - W. H. Twenhofel and F. T. Thwaites

The Lower Coal or Schoolcraft and Byron or Hendricks members are present. Both red and gray tills occur. The striae are a product of the earlier or Cary ice.

Village well finds base of Niagaran at depth of 170 feet.

- 23.8 _____ Stop sign. Continue on 10.
- 28.8 _____ Turn right (N) on to Highway 57.
- 36.5 _____ Greenleaf. Quarry to right will not be visited.
- 46.2 _____ Enter Depere. Turn right (E) around school, then keep to left street due east. Pick up county road G at stop sign. Continue ahead (SE) on G.
- 50.1 _____ Ascend Niagara escarpment.

- 51.4 _____ Katells Falls, STOP 11. Turn around in owners drive, head back west and park on north side only. PLEASE KEEP OFF GRASS. Descend into plunge pool on west side by trail.

Leader. - W. H. Twenhofel.

The stratigraphic section exposed at the falls includes the Mayville, some iron ore, and the Maquoketa shale. The falls is capped by the Mayville dolomitic limestone which is underlain by a few feet of shaly fossiliferous ore, and below that is the blue clay phase of the Maquoketa. Dalmanella rogata may be collected in some shale layers.

Return to cars and back-track to De Pere.

- 56.2 _____ Join Highway 32 and turn right (N).
56.5 _____ Turn left (W) on 32.
56.9 _____ Keep ahead over bridge (Fox River) and join Highway 41.
57.3 _____ Keep left at bridgehead, following 41.
72.8 _____ Turn left (S) on to Highway 55.
73.1 _____ Turn right (SW) on 55 across Fox River. Outcrop of Galena (Trenton) dolomitic limestone in stream bed.
74.1 _____ Left, then right one block on 55.
79.0 _____ Stop light. Cross 10 and keep ahead on 55.
80.6 _____ Stop sign. Keep left with 55.
82.3 _____ Sherwood. Ascend Niagara escarpment.
83.1 _____ Turn right (W) onto gravel road to High Cliff Park.
84.1 _____ High Cliff Park to right. STOP 12. Quarry in Mayville member with small exposure of Maquoketa below. Park on left side of road.

Leader. - W. H. Twenhofel.

Lake Winnebago is only about 20 feet deep. It lies in the "vale" or lowland due to erosion of the Maquoketa and is enclosed at the north by a Cary moraine buried under valders drift.

At this point, the party will break up. To reach 55 go straight ahead (south) at Park entrance.